VOL. XXVIII. No. 10 OCTOBER 1943

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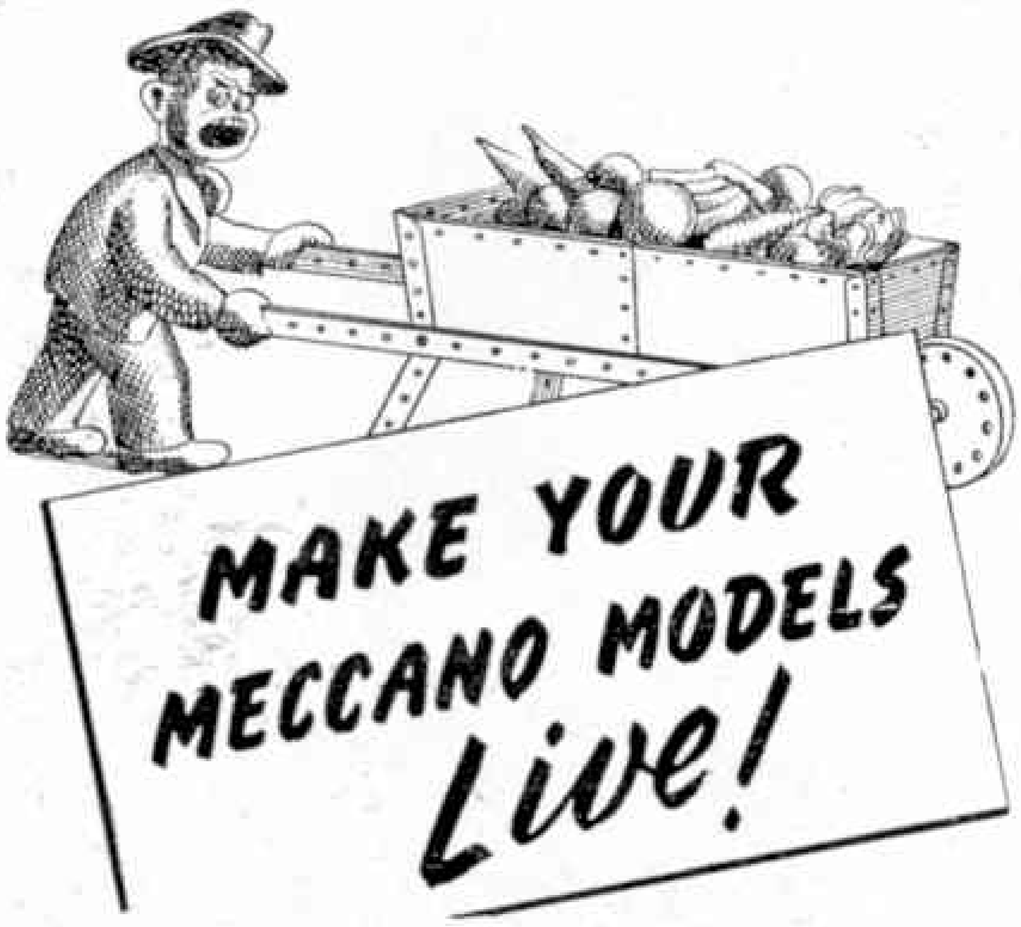

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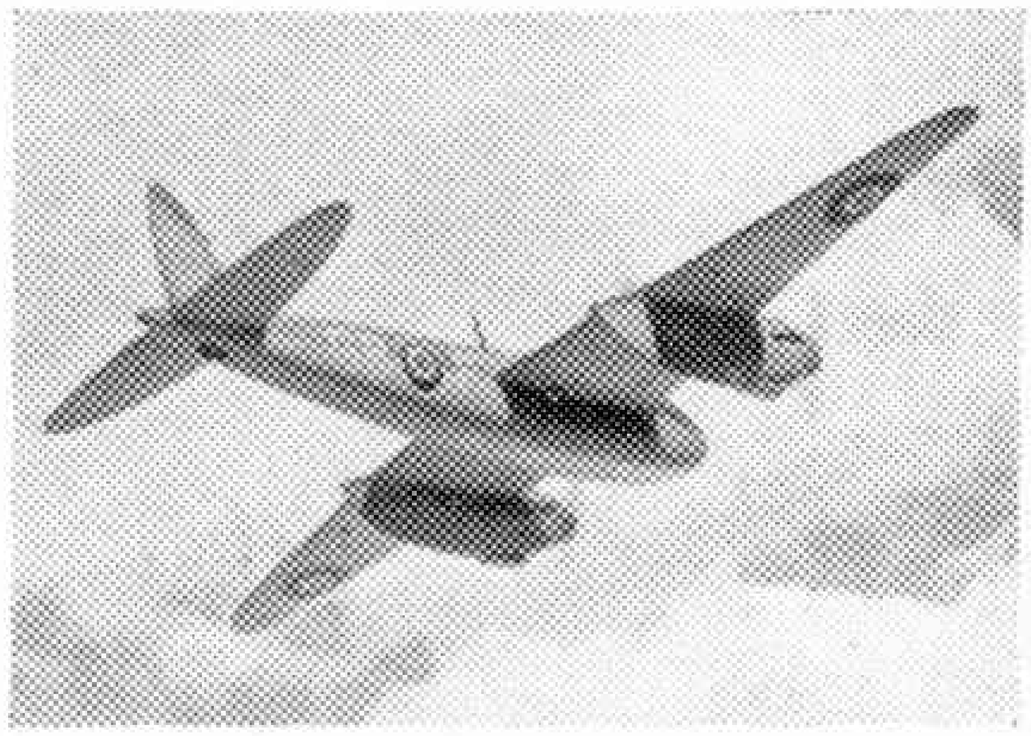

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THE SPY-CLISTS. Michael and Monica were mystified at Miss Skinner's broken remark about the spy. But Miss Skinner would say no more, switching the —(1)— to the garden she was painting. Monica watched the roses and hollyhocks coming to life under Miss Skinner's brush. "Isn't that where the new schoolmaster's staying?" she asked.

"Yes," said Miss Skinner, "Half the school house has been taken over by the Air Force. He's only just got the two big class rooms, so he's lodging with Mrs. Turner."

"Isn't that him now coming along the lane?" said Michael suddenly.

Miss Skinner looked to see. "Yes, that's right. I —(2)— afternoon school is over." As he came —(3)— she called out brightly, "Good afternoon, Mr. Smith. I hope everything went well on your first day?"

Mr. Smith smiled and came over to them. "Very well indeed, thank you," he said. Then he saw Miss Skinner —(4)—. "But how charming that is! I was just wishing as I came along that I had a photograph of the —(5)— to send to my sister to show her where I am staying."

"Oh, in that case," said Miss Skinner at once, "you must have my —(6)—. Yes, I insist" she added as Mr. Smith began to say that he really couldn't think of it, and she seemed so hurt at the idea of a —(7)— that at last he accepted it, and after thanking her several times, went off to the cottage.

"I suppose we'd better be going home, too," said Monica, walking towards the two B.S.A. Bicycles they had —(8)— up against the hedge. But a sudden cry of dismay made her turn. Miss Skinner had opened the portfolio where she had the sketches and a —(9)— gust of wind had blown several of them over the hedge.

All you have to do is to supply the 9 words which have been left out of the story. Write each one against the proper number in spaces provided on this form. Fill in your name, address, and date of birth, cut out and post to B.S.A. Cycles Ltd., Missing Word Competition, Dept. M.3, Small Heath, Birmingham, 11, to be received not later than November 6th. There are 3 prizes of £5, £3 and £2 for the best and most apt sets of answers. If two or more entrants tie for any one or more prizes, the prize or prizes will be divided equally between those entrants. Not more than one solution may be submitted by an entrant. The competition is limited to boys and girls under the age of 15 on the 1st October, 1943. The decision of B.S.A. Cycles Ltd., is final and no correspondence can be entered into. Names of winners will be published later in this paper.

Name .....

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(M.3)

Next Month. "THE TRACTOR ON THE FARM"

MECCANO MAGAZINE

Editorial Office:
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Liverpool 13
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Vol. XXVIII
No. 10
October 1943

With the Editor

Among the Bombers

This month I specially recommend to all readers the first of two articles on bombers and their work by C. G. Grey. "C.G." has a wonderful knack of taking us with him in spirit and making us share his enthusiasm.

These articles, especially the second, which will appear next month, give a vivid picture of what really goes on day after day and night after night at bomber aerodromes. In particular I am sure they will bring to most of my readers an entirely new idea of the importance of the ground staff and the amazing variety of their jobs. I have come across many people, of all ages, who pride themselves on being able to identify almost any aircraft, and yet have only the foggiest notion of what happens at a bomber aerodrome. As far as I can make out some of them seem to think the bombers are dealt with like cars in a garage!

I hope all readers who know folks of this kind will make them read these articles. They will then perhaps understand how it is that a raid on which 1,000 bombers take part calls for the services of at least 100,000 people.

Lieut.-General George S. Patton.

Leaders in the War

Lieut.-Gen. George S. Patton

Lieut.-General George Smith Patton was born at San Gabriel, California, in 1885. He was trained for an Army career, graduated from the U. S. Military Academy in 1900, and passed through the Cavalry School in 1913. He was aide-de-camp to General Pershing in Mexico in 1916–17, and in this capacity accompanied him to England in May 1917. He was the first man detailed in the Tank Corps, U.S. Army, in November 1917, and he formed and conducted the Tank School and the 1st Brigade.

During the next 17 years he held a succession of U.S. Tank Brigade and Cavalry Commands, and from 1935 to 1937 was a member of the General Staff. He was appointed to the 2nd Armoured Brigade in July 1940, and later given command of the 2nd Armoured Division. In the present war he has commanded American Forces in the victorious North African Campaign.

General Patton is a popular leader and is known to his troops by the affectionate but inelegant name of "Old Blood and Guts."

All Among the Bombers

1—The Machines and their Crews

By C. G. Grey

Founder of "The Aeroplane" 1911, Editor until September, 1939

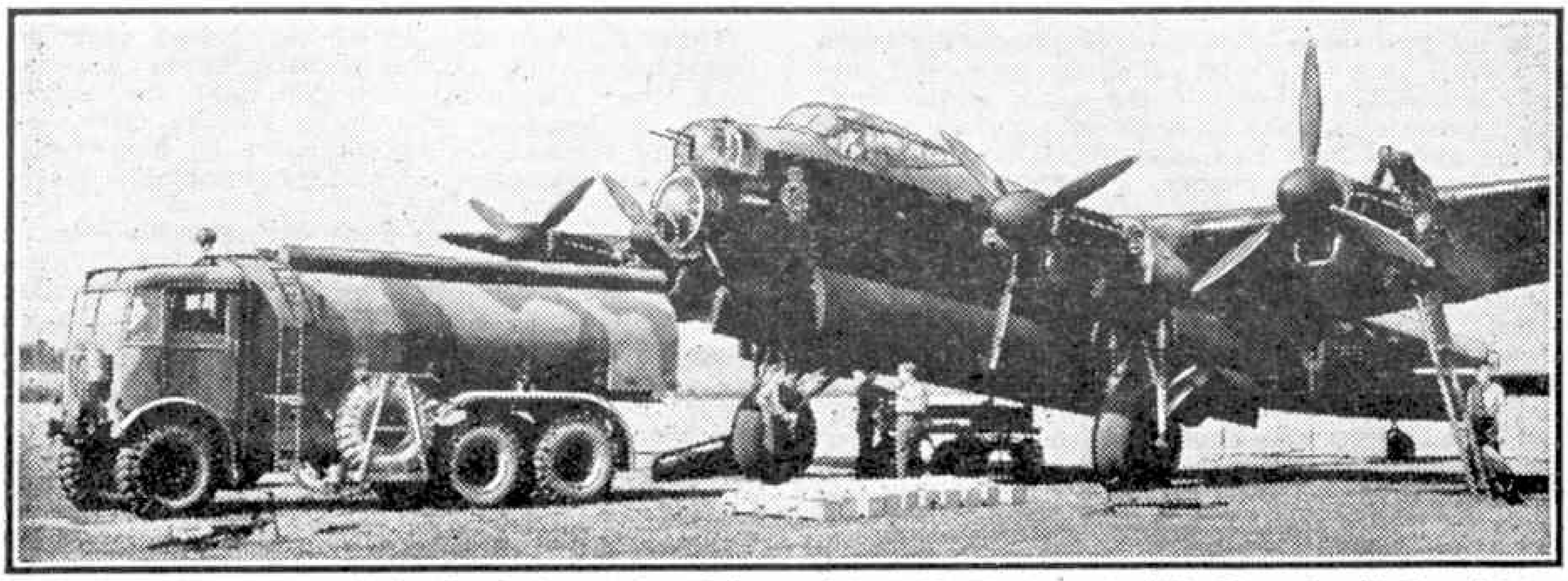
ONLY a matter of months ago the pilots of single-seat fighters were looked upon as the star turns of the air, not only in our own Royal Air Force, but in all others. A fighter pilot who brought down a few enemy aircraft was hailed by the newspapers as an "ace"—a horrible epithet taken from the French in the last war; and how the victims hate being so called! But now most of the limelight and glamour and romance has been switched over to the bombers, who equally dislike being boosted as popular heroes individually. So, knowing lots of both branches of the R.A.F., I do not propose to write about heroes, but only to give a plain picture of the men and their machines and the work they do.

For a start, there is still a common idea that when war began the R.A.F. were hopelessly inferior in numbers, and in the quality of their aircraft, to the Luftwaffe. Nothing has happened to show the truth of that notion. For months before the German break-through into Holland and Belgium, our bombers used to go right across Germany from bases in France, dropping silly pamphlets, which a humorist called "bomphlets." The leaflets did no good, but the flying in all sorts of winter weather trained numbers of bomber pilots and crews, so that, when our turn came to go bombing, our men were better airmen and better navigators than were the Germans. These veterans of the early days of the war, and quite a lot of the men who flew in the last war, passed on their knowledge and experience to those who are to-day the crews of "Halifaxes," "Lancasters" and "Stirlings." One may include also the crews of the "Sunderlands," "Wellingtons," "Liberators," and "Fortresses" of Coastal Command who have done so much to beat the U-boats.

In the Battle of Britain our fighters were sometimes outnumbered by the combined fighters and bombers as much as three or four to one. But, firstly, there is nothing new in a British fighting force on sea or land winning a battle when heavily outnumbered, so why should the air be different? Secondly, we had fighter squadrons all up the East Coast from Essex to the Firth of Forth, kept there to protect our Midland and Northern factory areas, and they never went into action at all. Similarly there were squadrons in the West Country which were never used, because they were guarding the Bristol and South Wales factory and colliery areas.

Bomber crew give the Victory sign.

Thirdly, we were never short of fighters. A year or more before the war, when the Air Ministry was dithering about what to order, Mr. T. O. M. Sopwith, Chairman of the Hawker Co., sent instruction to the works to put 1,000 "Hurricanes" in hand, without any Air Ministry orders. Consequently there were five "Hurricanes" in the battle for every "Spitfire," and "Hurricanes" shot down more enemy aircraft than did all other makes—our own and the enemy's put together. The "Spitfire's" days of glory came later, and I have always looked on that misleading film "*The First of the Few*" as referring to



Fuelling. A "Lancaster" bomber being prepared for a night raid. Photograph "The Aeroplane" Copyright.

the first of the few "Spitfires" in the Battle of Britain, and not to Mr. Churchill's few fighters to whom so many of us owe so much, because the first of those few were "Hurricanes," of which there were quantities still in store when the battle was won.

The point of this argument is that, if the Luftwaffe had been so much bigger than the R.A.F. as was supposed, the German bombers would have been all over the Midlands and North, instead of along our South Coast only as they were. And our fighters would have been swamped by the numbers of German fighters, which they never were.

Nearly all the bomb damage done in this country was done by night bombers before our radio location was fully developed and before we had enough night-fighters fully trained.

I am telling you all this so that you may see more clearly how splendidly our bombing attacks have developed since those days.

At that time Air Vice-Marshal Arthur Harris (now Air Marshal Sir Arthur, but always known in the R.A.F. as "Bert") was commanding a Group of "Hampdens" in and around Lincolnshire. They were fine flying-machines but as hopelessly under-armed against the German fighters as the German bombers were against our 8-gun "Hurricanes" and the later cannon-gun "Spitfires." So, with the technical help of his armament officers, and without asking leave of the Air Ministry "experts," Bert Harris re-armed a squadron of his "Hampdens" with double guns on quite different mountings, proved their use in battle, and then showed the Ministry their superiority. Like General Montgomery and other great leaders of the present and past, Bert Harris believes in acting on his own judgment and explaining his actions, and his reasons for them, afterwards.

And this is why he is Air Officer Commanding-in-Chief Bomber Command to-day, and it is largely why our bombers have had such a terrible effect on Germany. None but a born leader of men could have inspired and kept up the spirit and enthusiasm of our bomber crews as he has done. None but a commander of high quality could have picked his staff and subordinate commanders so that they would run his war in his way. And none but a man who has always been ready to sacrifice his own career for the sake of doing what he knew to be best for his men or his Service, or towards winning the war, could have got away with the things that he has said and done.

If he did not invent, he approved and put into action the "saturation" raids which have done so much not only to smash German armament factories but to reduce our losses in night bombing. Formerly our bombers went over in a long string for hours. Now they go over in a mass and unload everything in half an hour or so. The principle is that if you have one bomber over 50 searchlights and 50 guns it has a poor chance of escape. If you have 50 bombers at once over 50 lights and 50 guns some of them will not be hit, because several guns are sure to fire at one machine and no guns at another, and a lot will miss their targets anyhow. And if you have 50 bombers over one gun and one light, probably none will be hit, because the gun crew will be confused.

In a modern raid the sky is so saturated with bombers that the gunners are completely "foxed" and cannot choose a target, and the ground is so saturated with bombs that guns and lights are being knocked out or bumped about to

such an extent that they cannot see or shoot straight.

In the past three years, since the war really began in 1940, I have seen a lot of our bombers, and anybody who has watched how the spirits of the crews have risen steadily and how the quantity and quality of the aircraft have risen also, must have felt more and more certain of victory. I do not believe that any of us has ever thought seriously that we might be beaten, even during the Dunkirk defeat the idea never occurred to us; but sometimes victory seemed a long way away—and to-day it does not.

Only a few weeks ago an Air Vice-Marshal friend of mine took me out one night to see some 30 of his "Lancasters" start for Germany. We went round and talked to the crews as they were "emplaning," and stood under the bomb-bays and looked up at the 4-ton block-busters, all packed round with incendiaries. The Captains or the bomb-aimers told me a lot about the bomb-loads they were carrying and how the bombs behaved in falling and in bursting, and other interesting things that must not be put into print.

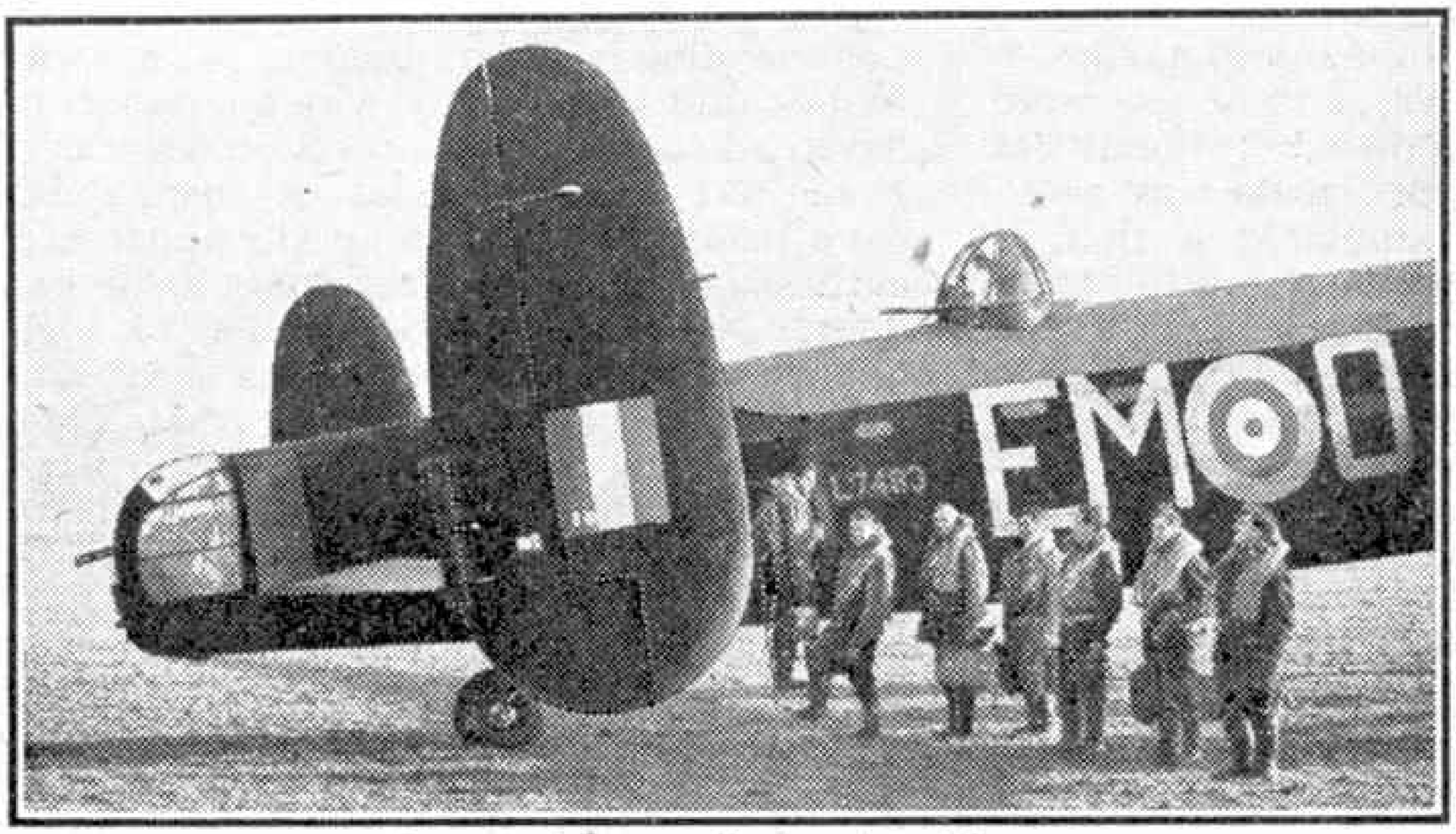
But what struck me most was that although most of them had been out the night before, none of them looked weary or nerve-strained. They might have been doing operational training instead of starting on a job from which they might not come back. I think one thing that helps their nerves is the knowledge that such a high percentage (I may not say how high) get down alive by parachute or by forced landing from machines that do not return. How people flew on operations for a year or more in 1914-18 without change to Home Establishment, and *without parachutes*, has been one of life's mysteries to me for 25 years.

The take-off was exhilarating. All the crews' best girls among the W.A.A.F.s, and their best pals among the airmen who were not on duty, came down to the end of the runway to wave each machine off. And the Air Vice-Marshal and sundry of his staff and the Group Captain commanding the station waved as enthusiastically as the rest. The crews like a glad hand as they start. So would you if you were in their places.

Every "Lancaster" took off just as it ought. There was no swinging of tails, no spluttering of engines. The four great engines of each machine roared, the brakes were let off, and each aircraft ran as straight as if it had been on rails. There was practically no wind, but the machines lifted in a distance which seemed incredibly short, when one knew the loads that they were carrying. Keeping a good aeroplane down seems as hard as keeping a good man down. And if a machine does not take off in two minutes from getting the signal to go, that is a frightful "black" on its ground-crew.

Here I may say, with just pride, that our "Lancasters" and "Halifaxes" lift between three and four times the load of bombs that the biggest American bombers now in service can carry, and ours are between 30 and 50 miles an hour faster; so you see, this effete old country is not quite played out yet.

A few hours later we went out again to welcome the bombers home. They had started in daylight, now the dawn was just showing. We passed another aerodrome which had a string of huge lights all round it. The aerodrome to which we were going was likewise in a blaze which could be seen 10 miles away. Thinking of our own strict blackout I asked the Air Vice-Marshal what about it. He answered that these lights saved minutes in landing and relieved tired pilots of a lot of nerve-strain. In these days Luftwaffe "intruders" so seldom appear, and are so regularly shot down when they do, that they are not worth bothering about. And anyhow every light on and round the aerodrome can be switched off at once if needs be, whereas one cannot switch off the lights of a whole city.



Bomber crew "going aboard."

The "Lancasters" came in with the regularity of Tube trains and at shorter intervals. Several of them were missing. For months the station had been very free from losses; that night their luck was out. Taken as an average over the months the loss was a very low percentage for the station, and taken as an average for the whole Group on that night the loss was very low, for many stations had lost no aircraft. But the loss was rather a shock, lessened by the known figures for escapes from shot-down machines.

The crews who came in for their morning tea and questioning by the Intelligence Officers looked as though they had done a hard day's work. But they talked cheerfully before going to bed.

The losses in killed and wounded among bomber crews who come home is very small. The armour is so skilfully placed that it protects the men against cannon-gun shells and bullets from night-fighters and against any but big chunks of flak shells. Yet sometimes one meets sheer rotten luck.

Lately I saw a "Halifax" which had been shot about a bit by fighters and flak, but there was nothing to stop it from getting home. Yet it had lost two men and had nearly lost itself by two chances in 10 thousand which came off.

The German night-fighters are very gallant fellows, so, while this machine was held in a searchlight beam and was being shot up, two fighters came in through their own flak into their own beams. One attacked underneath while the bombs were dropping and one attacked dead astern. The flight-engineer and the radioman were standing over the open bomb-doors, to set free any bomb which might stick in the release-gear, when a cannon shell from the fighter below came through the open doors, hit something and burst. One small splinter hit the radioman in the groin and cut his femoral artery in the one place where it could not be held by a pad or a tourniquet, and he was dead in five minutes.

The tail-gunner, a Canadian kid, had swung his turret round to the left at right angles to get a shot at the Hun below, leaving (*Continued on page 358*)

Have You Ever Thought About This?

VI.—Why Machines Require Oil

OILING up is one of the most familiar aspects of engineering maintenance, so much so that the expression "to oil the wheels" is often used in everyday speech in relation to any action or deed calculated to help life to go on more smoothly. But what we are interested in now is to find out just why oil is so vitally necessary to the successful working of any machine.

Where moving parts are concerned there are many places where metallic surfaces slide one upon the other. No matter how smooth these surfaces may be, the sliding contact causes friction if both are dry, and a considerable amount of power has to be exerted to overcome it. More than this—the rubbing of the two surfaces generates heat, and this represents a further loss of power. If the motion under these conditions is continued for a long enough time the metal begins to protest—by squeaking! If this protest is still ignored, heating continues, with eventually some spectacular and disastrous results.

Most of us have watched and admired the craftsmanship of a blacksmith; how he heats up the separate pieces of iron to a white heat, and how with heavy, yet deft blows of his hammer he welds the parts together—simply on the anvil. Well, our two metal surfaces sliding upon each other, and getting hotter and hotter, eventually reach welding heat; the pressure between the surfaces takes the place of the blacksmith's hammer, and suddenly the two weld themselves! In other words—the machine seizes up.

The secret of successful machine operation is never to let moving metallic surfaces come into direct contact with one another, and this is done by keeping a film of oil between. Not only does the oil prevent heating, but also it reduces the friction to a minimum and enables the two parts to slide much more easily.

Correct lubrication is an art in itself, for as much damage can be caused by using the wrong grade of oil as if no oil had been used at all. In the case of a steam locomotive, for example, there are many places where ordinary sliding takes place, as in the axle journals, the slide bars, and in parts infrequently moved such as the pick-up water scoop, the regulator handle, and reversing gear. In addition, however, there are the pistons, which are not only in constant sliding contact with the cylinder walls, but are also continuously at the same temperature as the highly superheated steam. The oil used for lubricating the pistons and piston rods must be capable of providing that film of oil at very high temperature. Many oils would ignite at such temperatures, and deposit a layer of carbon on the working parts as well as damaging the packings.

At the other end of the scale there are jobs where special oils have to be provided to work under extreme conditions of cold, such as on the railways of North Russia. Parts used intermittently, such as signals or points are apt to freeze up unless suitable grades of oil or grease are used. With machinery under continuous heavy duty an occasional liberal oiling is not nearly so beneficial as a continuous supply of just the right amount of oil to keep the thin film between surfaces. A certain amount of the oil leaks away and this requires continuous replenishment. For this purpose many forms of mechanical lubricator have been designed, while in some of the latest forms of locomotive cylinder lubrication the oil is delivered in the form of a fine spray mixed with the steam.

Most forms of lubricating oil are obtained from petroleum, that is crude mineral oil. It is refined to the degree required by a process of distillation. The oil is classified not only by its flash-point, which is the temperature at which it ignites, but also by its viscosity. This latter property is a measure of its oiliness—of the readiness or otherwise with which it flows. Precision machinery, of which the ordinary domestic sewing machine is a good example, requires an oil which has a higher viscosity than that used for comparatively rough jobs. To assist in spreading the oil over the entire surface of a bearing, particularly with parts having an oscillating movement where the shaft never makes a complete revolution, the journals are often designed with a system of shallow grooves, which are kept filled with oil, and from which the oil is easily spread throughout the bearing. In heavy express traffic a modern locomotive will consume 1 lb. of cylinder oil and 4 lb. of engine oil every 100 miles of the journey.

O. S. Nock.

Steel-Making in the Open Hearth Furnace

IN the "*M.M.*" for April 1942 we described the making of steel by means of the Bessemer converter devised by the English inventor Sir Henry Bessemer. This month we deal with the great rival process in which the open hearth furnace is used, and which is the source of manufacture of about two-thirds of the total quantity of steel made in this country. Our cover, reproduced by courtesy of The Wellman Smith Owen Engineering Corporation Ltd., gives a striking impression of a furnace of this type.

The open hearth furnace was invented in 1865 by the brothers Friedrich and William Siemens, who were born in Hanover but migrated to England and obtained British citizenship. William in fact was later honoured with knighthood by Queen Victoria. The furnace was employed for the melting of iron and the making of castings; only when the Siemens brothers made contact with Emil and Peter Martin, father and son, of Sireuil in France, who had devised a means of preheating air for combustion in furnaces, was it possible to obtain the higher temperatures, such as are required for the making of steel. The combination of the efforts of these four inventors resulted in the construction of a furnace which has given its name to the Siemens Martin process. The first successful furnace was built in this country at Landore, near Swansea, and operated there for many years.

In the Bessemer converter the high temperature necessary to purify the iron is produced by the heat of combustion of the impurities in the metal. In the Siemens Martin, or open hearth furnace as it is usually called, the same result is achieved by making use of the heat of the gases introduced into the furnace. The melting chamber is a shallow boat-shaped hearth, into which the metal to be melted is charged. This may be composed entirely of cold scrap iron and pig iron; or if blast furnaces are adjacent to the steel plant, molten iron is largely employed. Depending on the quality of this molten iron a suitable quantity of cold metal is added to the charge, and also at times some rolling mill cinder and raw iron ore.

At each end of the furnace hearth openings or ports are placed, through which the heated gas and air enter and pass out after combustion, and after giving up a large part of their heat to the metal in the furnace. The gas employed may be either generated direct from coal in gas producers, or it may be brought in from coke ovens and blast furnaces. In the latter case a mixture of the two sources of supply in the ratio of one of coke oven gas to two of blast furnace gas is usually employed. Both the gas to be used and the air required for combustion are passed separately through regenerator chambers situated below the level of the furnace and usually under the charging platform on which the furnace men work. These chambers are packed with firebricks arranged chequer fashion in order to produce a series of passages, both vertical and horizontal. The outgoing gases from the furnace pass through this chequer work and give up their heat to the brickwork. In turn the ingoing gas and air take up heat from the chequer work, and frequently enter the furnace at a temperature as high as 1,200 deg. C. On entering the furnace they meet and are ignited, so that they generate an intense heat over the furnace hearth.

At intervals of about half an hour the

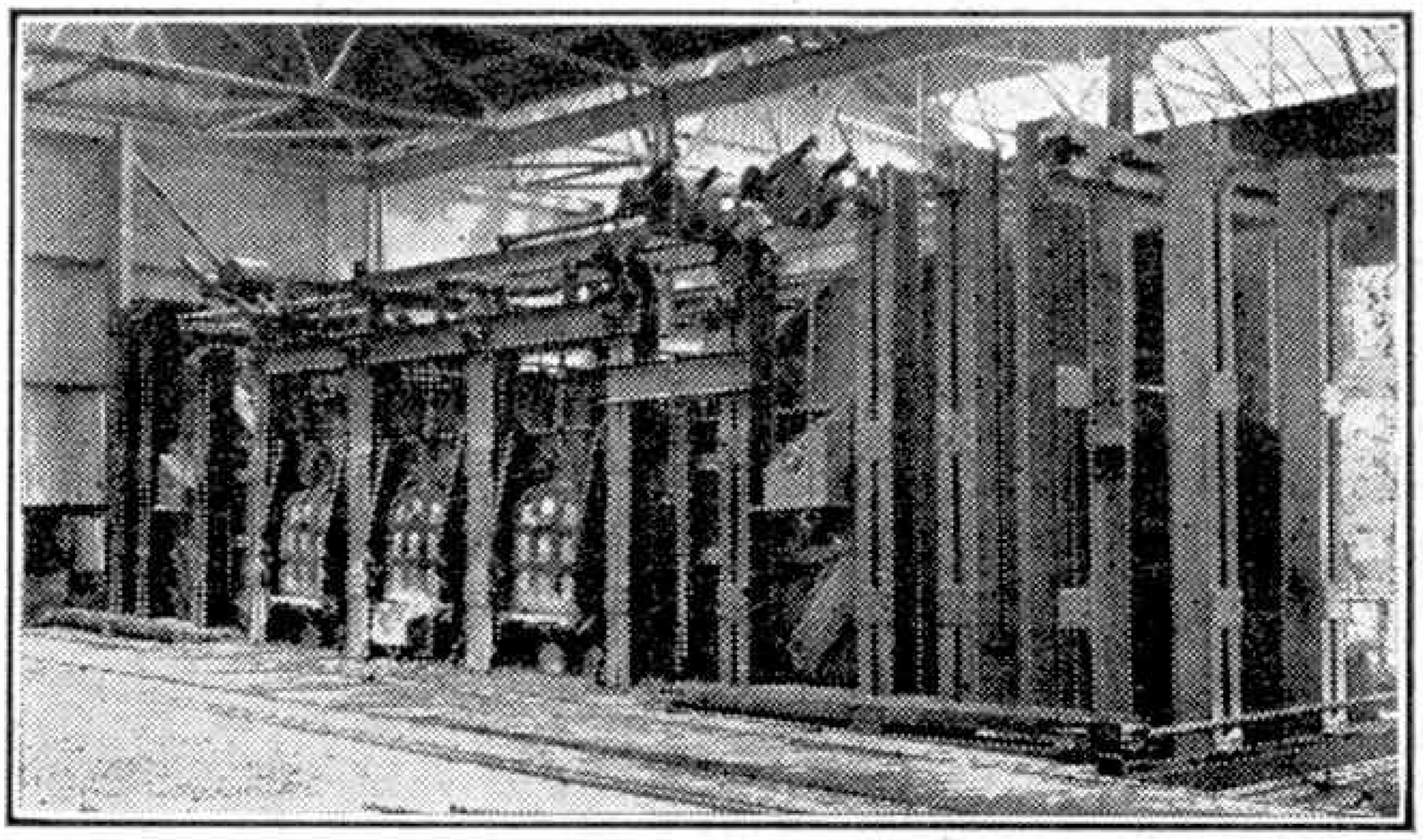


Fig. 1. Fixed Open Hearth Steel Furnace, view at charging side. Photographs by courtesy of The Wellman Smith Owen Engineering Corporation Ltd.

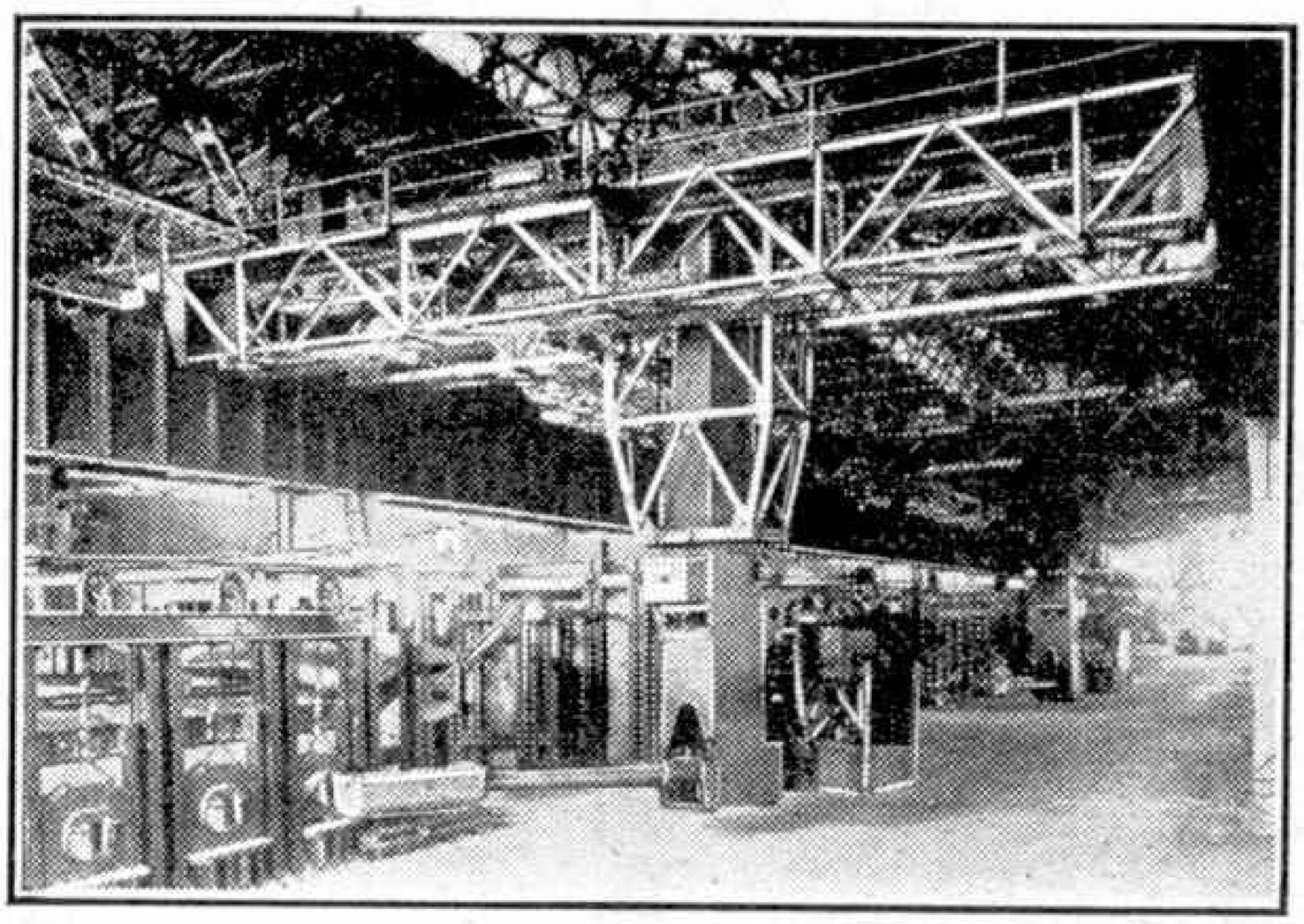


Fig. 2. Open Hearth Steel Plant equipped with three Wellman Chargers, each 3-tons capacity, serving a Battery of nine Wellman 70-ton Open Hearth Furnaces.

direct flow of the gas and air is reversed by means of suitable valves. In this way one set of gas and air chambers at one end of the furnace is receiving exhaust heat from the furnace, and those at the other end are supplying hot gas and air to the furnace. Further utilisation of the heat of the outgoing gases is frequently made by passing them through a so-called waste heat or heat recovery boiler employed for the raising of steam.

The earlier open hearth furnaces were fixed structures built of refractory brickwork and strongly bound by means of structural steelwork. They are provided with a suitable number of doors for the charging of the metal to be dealt with, and they have a tap-hole on the rear side that is normally closed by means of a plug of refractory material which is knocked out when the charge of steel is ready for tapping. A furnace of this description is illustrated in Fig. 1.

Alternatively to the fixed type of furnaces, tilting or rolling type furnaces were introduced in America by Samuel Wellman, who had taken a leading part in the introduction to that country of the Siemens Martin process. In furnaces of this type the tap-hole is above the level of the charge of metal in the normal or melting position, and therefore does not require to be sealed up, but is only loosely covered to prevent air being drawn into the furnace. Such furnaces were first of all mounted on rockers, but are now generally carried on a system of rollers and rotated by means of either hydraulic cylinders or electric motor driving gears operating through racks. Furnaces of this type are frequently built in capacities up to 300 tons, whereas the fixed type furnace is rarely found in this country to have a charge capacity exceeding 100 tons. In America, on the other hand, fixed furnaces have been built in very large sizes, but their employment does not appear to meet with favour among British steelmakers.

The rolling furnace has the advantage that no more labour is required for its operation than is the case with the fixed furnace of much smaller capacity, and it is possible either to tap the whole of the charge at one time, or to split it up into different charges, as may be desired. The removal of the slag formed during the process of refining the metal is also facilitated by reason of the possibility of tilting the furnace on the charging side and allowing the slag to run off through notches formed in the furnace doors.

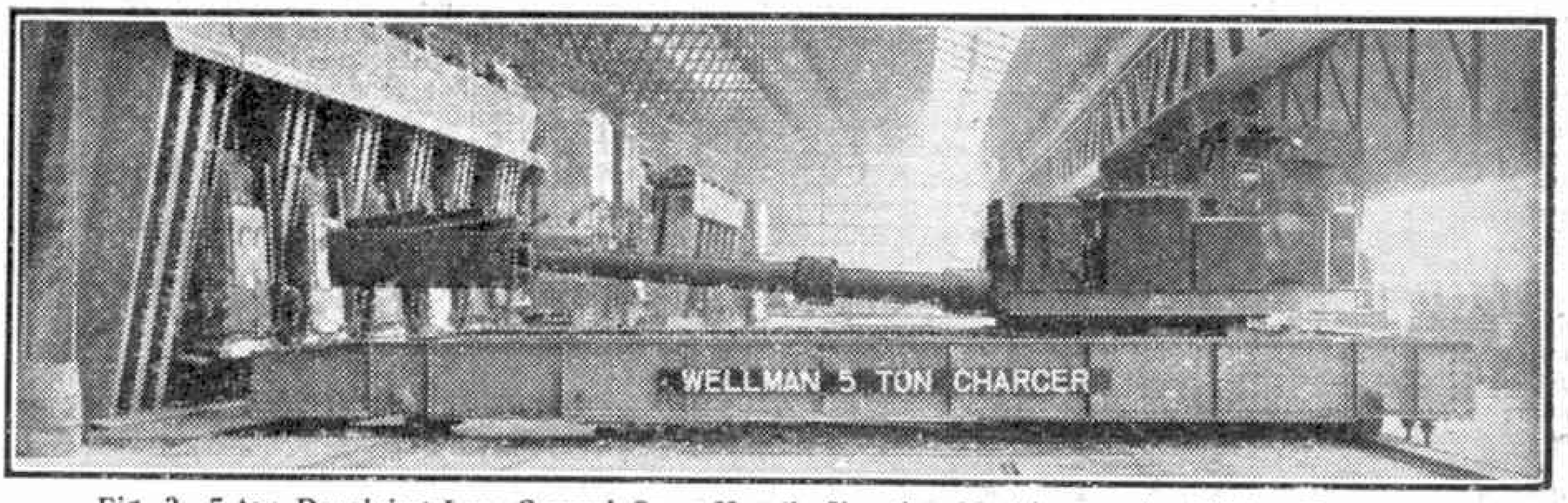


Fig. 3. 5-ton Revolving Low Ground Open Hearth Charging Machine serving Tilting Furnaces.

For a long time open hearth furnaces were charged by hand. This was a laborious task, requiring even for a small furnace a large squad of men. The work of putting a large tonnage of cold metal into the furnace occupied a considerable time, and during this period a large amount of heat was lost through the open doors. Mr. Wellman therefore occupied himself with the design of a machine to undertake the work of charging furnaces, and he was successful in 1895 in bringing out a suitable design. This was a machine which ran on the charging floor, and was soon followed by other types, with the result that the Wellman charging machine has long since become world famous. Development of the Siemens Martin process has indeed much for which to thank the inventive capacity of Mr. Samuel Wellman.

Fig. 2 gives a view of an open hearth steel plant equipped with three Wellman chargers of 3 tons capacity each, and this is a type of machine now very much employed in this country, and also on the Continent. From an examination of the illustration it will be seen that the charging arm proper is suspended from an overhead bridge, which travels up and down the shop on a heavy rail track. The material to be charged into the furnaces is carried in boxes which are brought up to the charging platform by means of cranes specially provided for this purpose and operating in an adjacent building called the scrap yard. The boxes carry a considerable weight of scrap metal or cold pig iron, and are emptied into the furnace by rotation of the charging arm. Another form of charging machine commonly used in this country is shown in Fig. 3. This machine runs on rails placed on the charging floor of the steel plant. It has travelling, cross traversing, slewing, lifting and box turning motions, all operated by electric motors and controlled by one man. It is a matter indeed of considerable interest for a visitor to a steelworks to watch charging machines in service. Although they require skilful manipulation, it is remarkable how soon the operators learn to control them with the greatest of ease, and what pride they have in their machines.

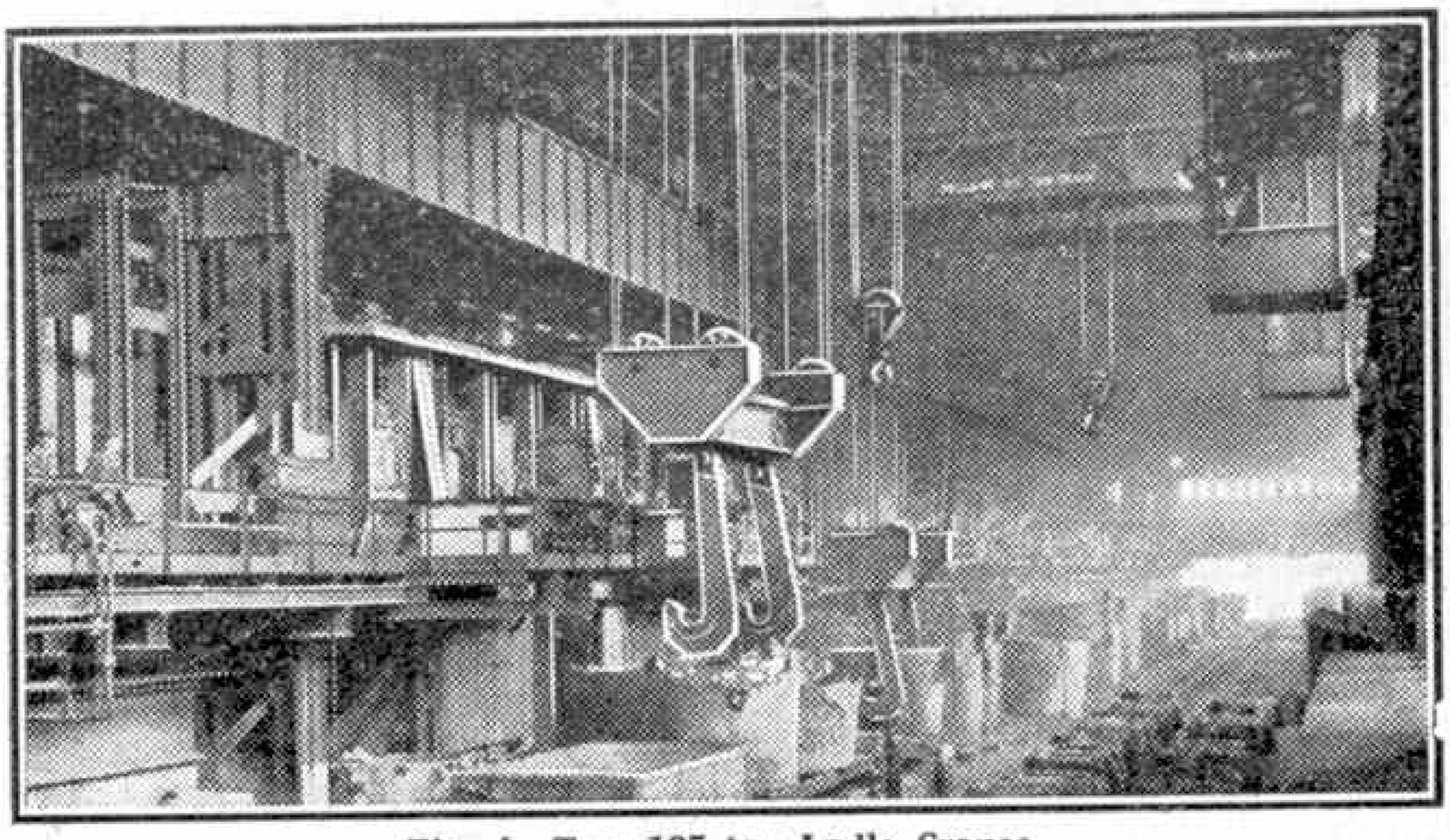


Fig. 4. Two 125-ton Ladle Cranes.

Great care requires to be exercised by the steelmaker to ensure that the quality of the steel made in the furnace is to the desired specification. The number of grades of steel which can be made is in fact legion. Accordingly samples from the bath require to be taken from time to time during the melting process. These are examined in the laboratory or subjected to so called hammer tests on the charging platform.

The charge of steel when ready for tapping is run from the furnace into a ladle, which may be carried in a carriage or more frequently suspended from an overhead travelling crane. A view of cranes employed for this purpose is seen in Fig. 4. The tapping of a furnace is to a visitor a stirring sight. The white-hot liquid steel flows quickly from the furnace down a long spout into the ladle, throwing out volumes of sparks during its passage. The ladles require to be heated before reception of the metal in order to avoid chilling action, and they are of course lined with refractory material and fitted with hand-operated stoppers to control the subsequent flow of the steel into the ingot moulds.

The interesting processes that follow this stage—the removal or stripping of the ingot moulds from the ingots; the placing of the ingots in the soaking pits, and finally their removal from the soaking pits to the rolling mill shop, were dealt with on page 183 of our June 1943 issue.

How British Airways "Carried On" at Malta

THE story can now be told of how for several months, when the blitzes on Malta were at their height, aircraft of British Overseas Airways maintained unbroken communication with the besieged island. These unarmed machines had been calling at Malta since October 1941 on their way to the Near East, running the gauntlet of the German and Italian air bases on both sides of the Mediterranean. In 1942, when the air attacks were in full swing, the maintenance of the services involved still greater risks. Available aircraft at that time were scarce, and many of them were either ill-adapted for the work or had only primitive navigation and other equipment. Some were twin-engined machines intended for North European operation, and the British Airways crews were well aware that if one of the engines should fail on the 1,000 mile flight over the sea, the other would not be able to keep the machine in the air.

Flights were so timed that the aircraft should arrive after dark. At first it was arranged that if an air raid should be in progress on arrival the Captain should stand off 50 miles to the south until the "All Clear." Before long, however, the raids were practically continuous. Often the intrepid merchant airmen would arrive to find an air raid in full swing, and the sky full of flak and fighters—both our own and those of the enemy. It was impossible to wait for an "All Clear," and they had to go straight in to land. On the aerodrome the traffic staff and ground engineers would be waiting. Unloading and loading, refuelling, and checking over the engines would be done in pitch darkness while the raids went on.

Sometimes the aerodrome would be out of action owing to bomb craters or crashed aircraft on it when the British Airways machines arrived, and the Captains would have to circle round the inferno of flak among the enemy fighters, unarmed and defenceless, until the runway had been cleared. Once a Captain came in six times to land, only to be warned off each time at the last moment because the aerodrome was obstructed. It was two hours before he could get in.

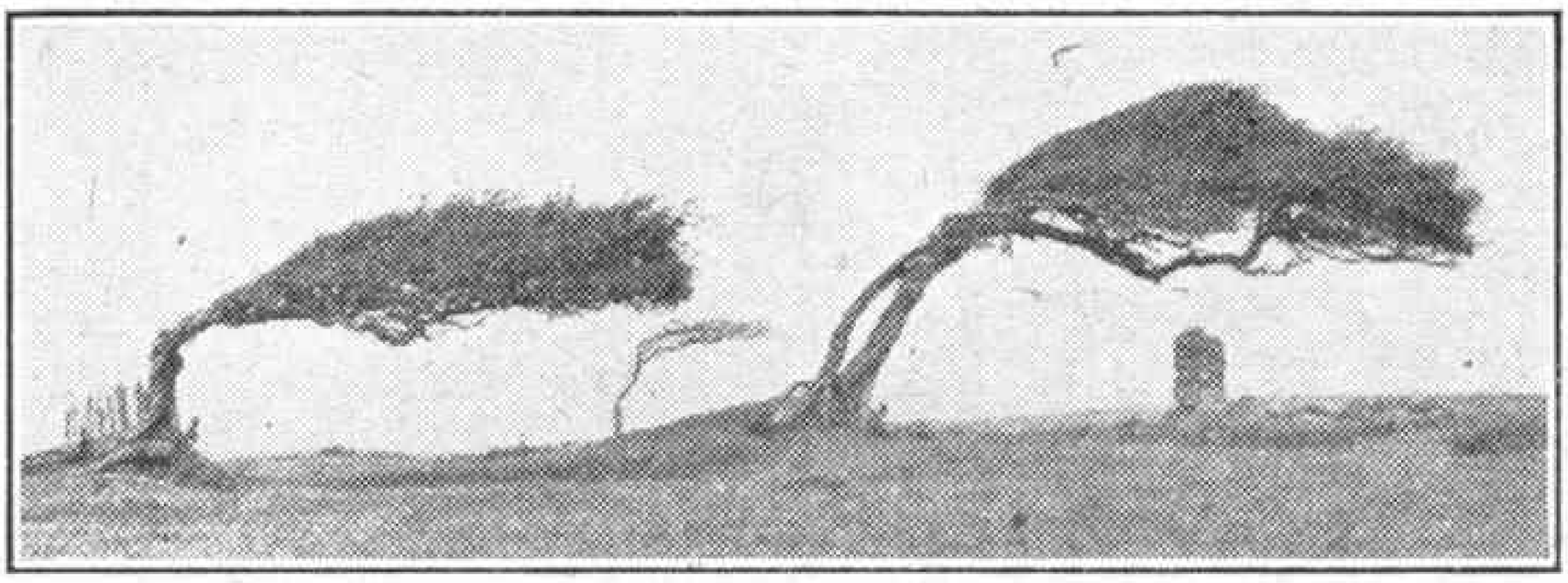
Take-off also was done in darkness, the "flare path" frequently being indicated only by a torch.

In spite of all these hazards, British Overseas Airways carried many hundreds of passengers to and from the island, including on the outward journeys many sick and wounded, as well as women and children.

Of General Interest

Waterproof Matches

There are many parts of the world where matches become useless within a very short time of exposure to the atmosphere. In hot steaming jungles or on board ship they absorb moisture so quickly that they cannot be struck, and instances have been known in which explorers or prospectors have been frozen to death in Arctic regions because they had no dry matches with which to light fires. So far matches for use in these conditions have been issued in waterproof boxes, but a new waterproof match that has been developed will be much more reliable. This has been produced chiefly for men in the American Armed Forces, and the necessary protection is given by covering the heads of the matches with a water-resistant film. The scheme has been so successful that matches so treated have remained effective even when left for several days at a high temperature in an atmosphere that can be described as dripping with moisture.



Going with the wind. Trees exposed to the full strength of prevailing winds on a desolate stretch of the Lancashire coast. Photograph by W. S. Garth, Preston.

Baffling a Marine Borer

One of the greatest enemies of the engineer, particularly in tropical waters, is the teredo, or marine borer, which greets with eagerness wooden piles driven to support piers and wharves of harbours, and in time so riddles them with holes that they become mere shells and collapse. Many plans have been tried in efforts to stop their destructive work, but none of them has been really successful. One of the most effective was to soak the wood in copper sulphate, or blue vitriol, but unfortunately this chemical was slowly dissolved out of the piles as they stood in water, so that it did not give lasting protection.

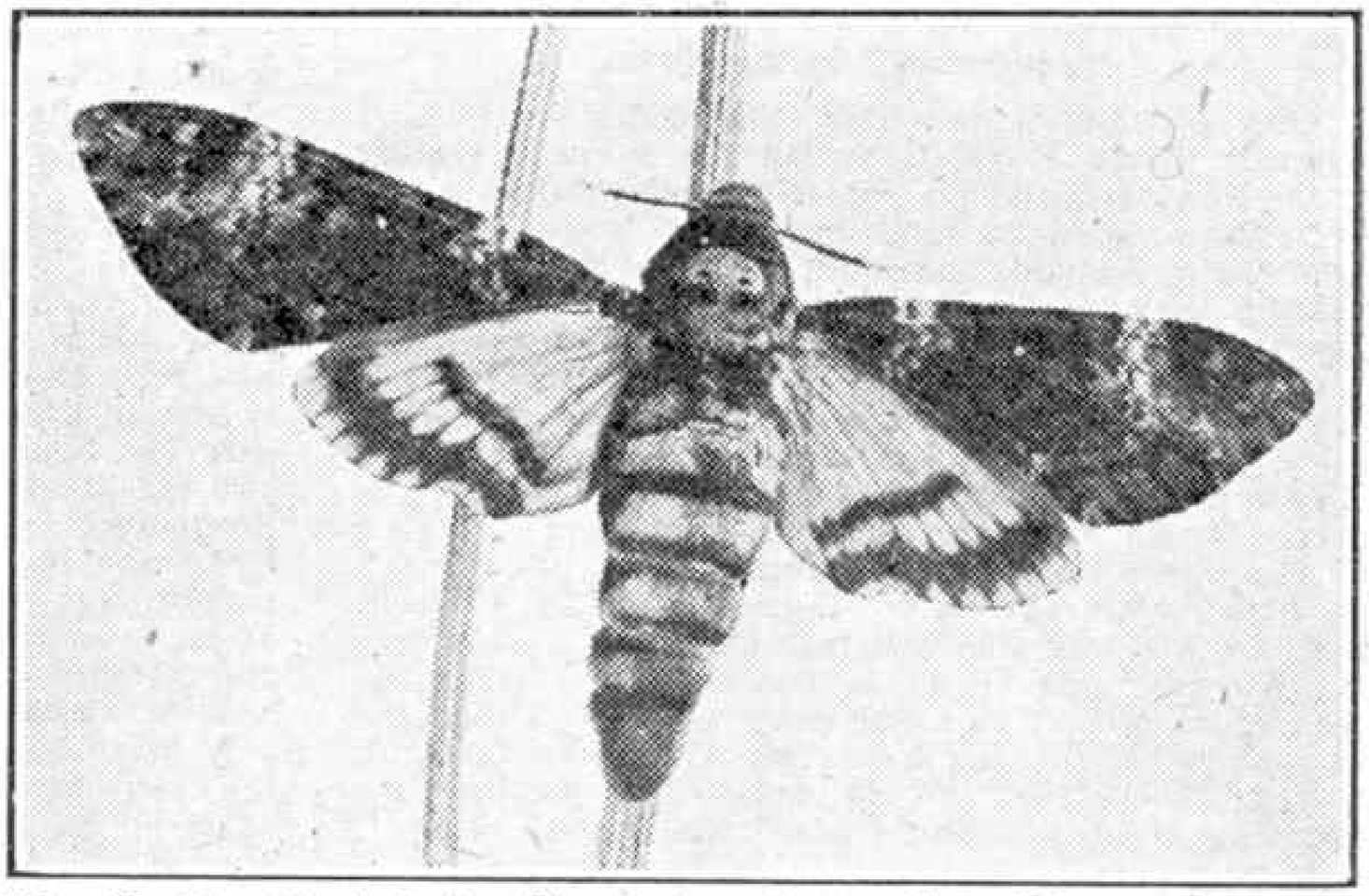
Now a new plan for protection with this chemical has been tried with success. In effect the wood is impregnated with copper by electro-plating. Slots are cut in the prepared pile and in them copper wires are laid. These are connected and the surface of the wood is given a coat of metal-graphite paint. A copper wire is then wrapped spirally round the pile, which is placed in a tank of copper sulphate. The wires are connected to the negative pole of a battery, the positive pole of which is connected to plates of copper hung in the tank, with the result that copper is deposited not only on the wood, but actually within it. Sulphuric acid and certain chemicals, the nature of which has not yet been revealed, are added to the bath used in this process.

When a pile prepared in this way is driven the spiral of copper wire is removed, but the wires in the slots remain in position. The process of deposition appears to continue in the sea water, the copper penetrating further into the pile, and it has been found that the metal actually reached the cores of treated piles that had been 17 years in the water. These were completely free from infestation.

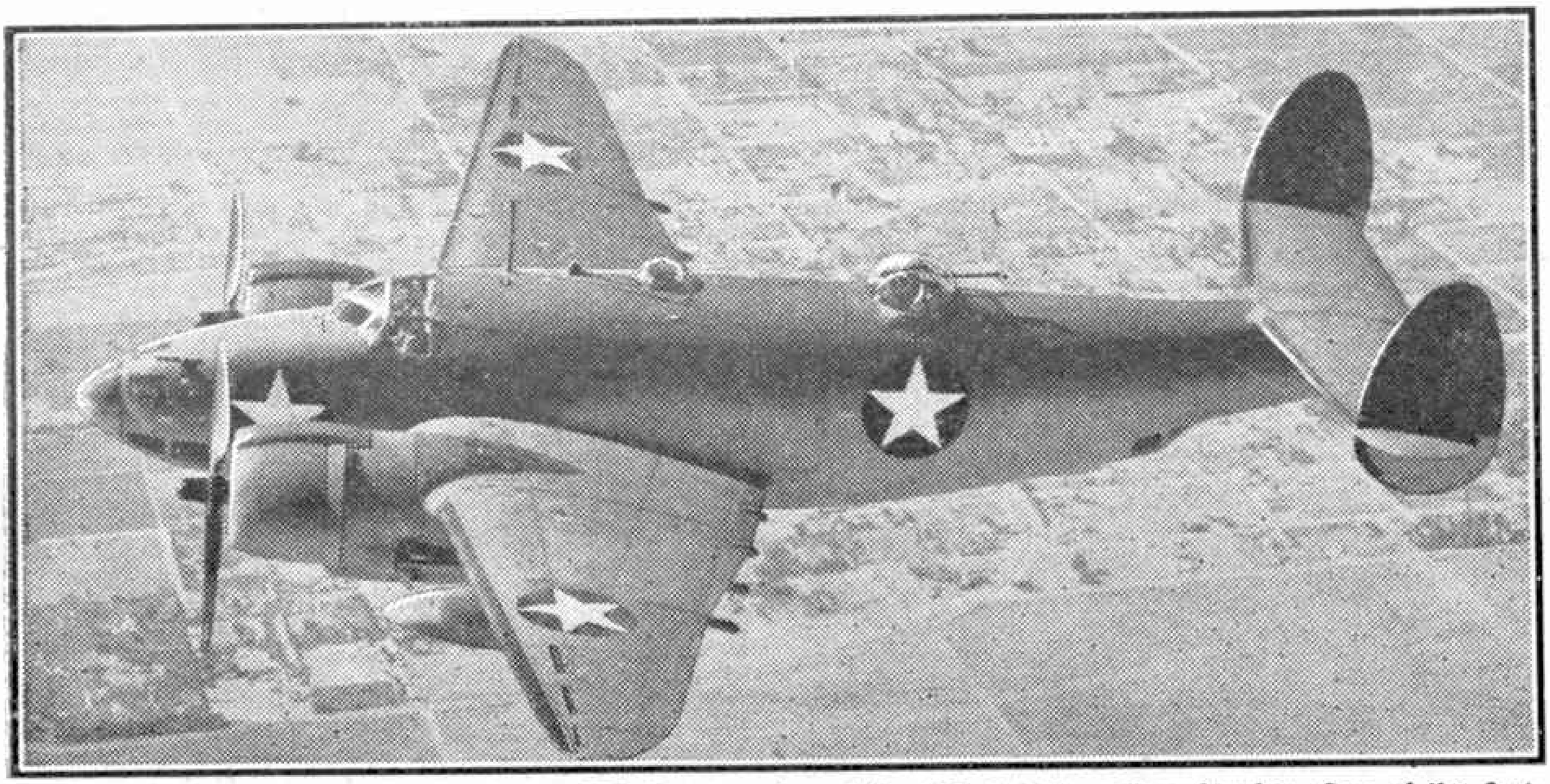
Fish that Answer to their Names

Can fish be tamed and taught to answer when their names are called? This sounds absurd, yet the fish kept in a famous pool at Key West, Florida, come at the call of their owner, feed from his hand and actually allow him to lift them and stroke them. The pool these fish live in is a large one and there are in it many kinds of fish and sea turtles. When the owner or his wife whistles and claps hands, the fish immediately hurry to the spot. Most of them have names, and each of these in turn comes forward quickly when its name is called. To prove that there is no deception about this the owner allows visitors to choose which he shall call and the right response never fails. Some of the fish can be persuaded to jump out of the water on to a stone, where they can be stroked without attempting to wriggle back into the water, and the owner of these remarkable fish can even lift them out of the water on his palm, to feed quietly on bread or biscuit.

One fish represented in this pool is the West Indian grouper, which grows to a huge size. A. Hyatt Verrill, the well-known American naturalist, tells of groupers that crowded round divers at work during expeditions he led to salvage sunken galleons north of Haiti, and at times even bumped into them. Dynamite explosions underwater did not scare them away.



The Death's Head Moth. The feature from which this moth gets its name can be seen very clearly on turning the illustration upside down. Photograph by E. E. Steele, Lincoln.



A fine flying view of the Vega PV-1, the U.S. Navy version of the "Ventura" medium bomber. One of the first PV-1s to go into service sank a Nazi submarine while protecting an Atlantic convoy. This photograph and the upper one on the next page are by courtesy of the Lockheed Aircraft Corporation, U.S.A.

Air News

Revised U.S. Aircraft Markings

The identification markings of U.S. military aircraft have been revised, and the familiar 5-pointed white star on a blue circular background is now supplemented by a white rectangle at the right and left of the circle, the whole being enclosed by a red border.

"Liberators" in the News

One of the Consolidated "Liberator" 4-engined aircraft of the Royal Canadian Air Force operating from Newfoundland on patrol over the Atlantic was recently ordered to land in Ireland owing to bad weather in Iceland, and landed 15 hrs. 26 min. after leaving Newfoundland. This was the first time a machine that had left the American continent on operational duties had been diverted to Ireland. On several occasions aircraft which have taken off from Iceland on patrol duties have been diverted to Newfoundland when bad weather had made it inadvisable for them to return to their base.

The latest version of the Consolidated "Liberator" is fitted with two 2,000 h.p. Buick-built "Wasp" engines, a retractable ball turret in the fuselage, and an Emerson gun turret in the nose that gives the gunner an almost all-round clear view. This machine is said to be carrying more than the 8,000 lb. bomb load of the "Liberator" III, and to have facilities for carrying a 2-ton "block-buster" under each wing.

British Airways Pilot Encounters Enemy Fighters

Capt. G. Rae, a British Overseas Airways pilot, has twice had thrilling encounters with German fighters. A few weeks ago while flying on a secret route his machine was attacked in this way, and part of the undercarriage was shot away, in addition to other damage. He had to make a crash landing, but neither he nor his crew were injured.

His most recent adventure was even more thrilling. He was homeward bound on this same route when he observed the vapour trails of two aircraft, above and behind him; these he soon identified as Focke Wulf Fw 190s. Realising that he was about to be attacked, he turned towards the two enemy machines and dived under them. He continued to dodge them, going down more than 20,000 ft. to sea level, while his two pursuers strove to head him off. Meantime he drew them farther and farther away from their base, hoping that shortage of petrol would ultimately compel them to give up the pursuit. In this he was apparently successful, as after half an hour the pursuers abandoned the chase. Having thus by his coolness and clever airmanship shaken off the enemy, Capt. Rae brought his aircraft safely to base.

Bristol "Beaufighter" Torpedo-Carrying Fighter

The Bristol "Beaufighter," which has shared with the D.H. "Mosquito" much of the intruder patrol duty over enemy aerodromes at night, and at the other side of the world, in action against the Japanese has been nicknamed by them "Whispering Death," is now in service as a fighter-bomber and a torpedo-carrying fighter. In fighter-bomber form it carries two 500 lb. bombs, and when employed on torpedo-dropping it has the torpedo slung under the fuselage by a wire rope and kept in place by crutches. This weighty projectile reduces the speed of the machine at sea level to about 300 m.p.h. Even with this load the machine can take off sufficiently quickly to clear a 50 ft. obstacle in 750 yards.

A very sharp reduction in speed is necessary when the torpedo is about to be dropped, and this is achieved in the "Beaufighter" by the operation of special bellows air brakes developed by the Bristol company and fitted in the trailing edges of the wings. The method of working these brakes is such that the forward speed of the aircraft is utilised to apply the brakes and, after the torpedo has been dropped, to release them.

The "Beaufighter" torpedo-carrying fighter has two 1,600 h.p. improved Bristol "Hercules" engines.

* * * *

Three new Lockheed "Lodestar" transports allocated to Canadian Pacific Airlines by the Joint Aircraft Committee, at Washington, U.S.A., have been delivered. These additions to the company's air fleet will enable them to cope with increasing traffic on their Vancouver-Whitehorse and Edmonton-Whitehorse routes.

Increasing Production of "Lightning" Fighters

Recently production of Lockheed "Lightning" fighters at Burbank, U.S.A., was halted for eight days while a new conveyor assembly system was installed in the huge assembly hangar. The new system has been evolved by the Lockheed company's engineers, and will enable the output of these aircraft to be doubled without involving any increase in factory space; the upper photograph on this page shows it in operation.

There are three continuously moving conveyor lines ranged in parallel and consecutive as to the work carried out on them. The aircraft under assembly move down one line, double back along the centre conveyor, and the third carries them again the length of the building and out of the door. The first and third lines are operated by power units pulling the connected line, and the centre or second line is operated by a unit pushing that line. Similar continuously moving conveyor lines are being set up for several of the sub-assemblies of the aircraft, and another mechanised line will carry the "Lightning's" two "Allison" engines to the point on the main line where they are attached to the machine.

At present the three main conveyor lines travel 4 in. per min., and this rate will be increased as soon as the employees have become efficient at getting a given job done before the aircraft pass on beyond their work station. Certain assembly jobs, however, take a considerable time to do, and the crew, or man, who begin one of these jobs stay on the aircraft until the task is finished or the shift ends; duplicate crews doing the work on succeeding aircraft.

Chinese Glider Factory

Some details have been issued of the Central Glider Factory on the outskirts of Chungking, China, which has been in operation almost a year. The factory cost £125,000 to build and equip, and employs about 400 people. It has been producing gliders, built mainly of native-produced materials, at the rate of about 20 a month. Three types of glider are built, of elementary, intermediary, and senior classes respectively; and 68 of the elementary type were completed in 100 days from the opening of the factory. Production is now centred chiefly on the other two types of glider.

The R.A.F. Photographic Reconnaissance Unit

In wartime photographic reconnaissance is one of the most important activities of an Air Force. Every big raid on enemy targets by Bomber Command, R.A.F., means more work next day for the R.A.F. Photographic Reconnaissance Unit in obtaining pictorial record of the damage inflicted by the raiders.

Lockheed P-38 "Lightning" fighters on the new "three abreast" mechanised conveyor lines in the huge Final Assembly hangar at Burbank, California.

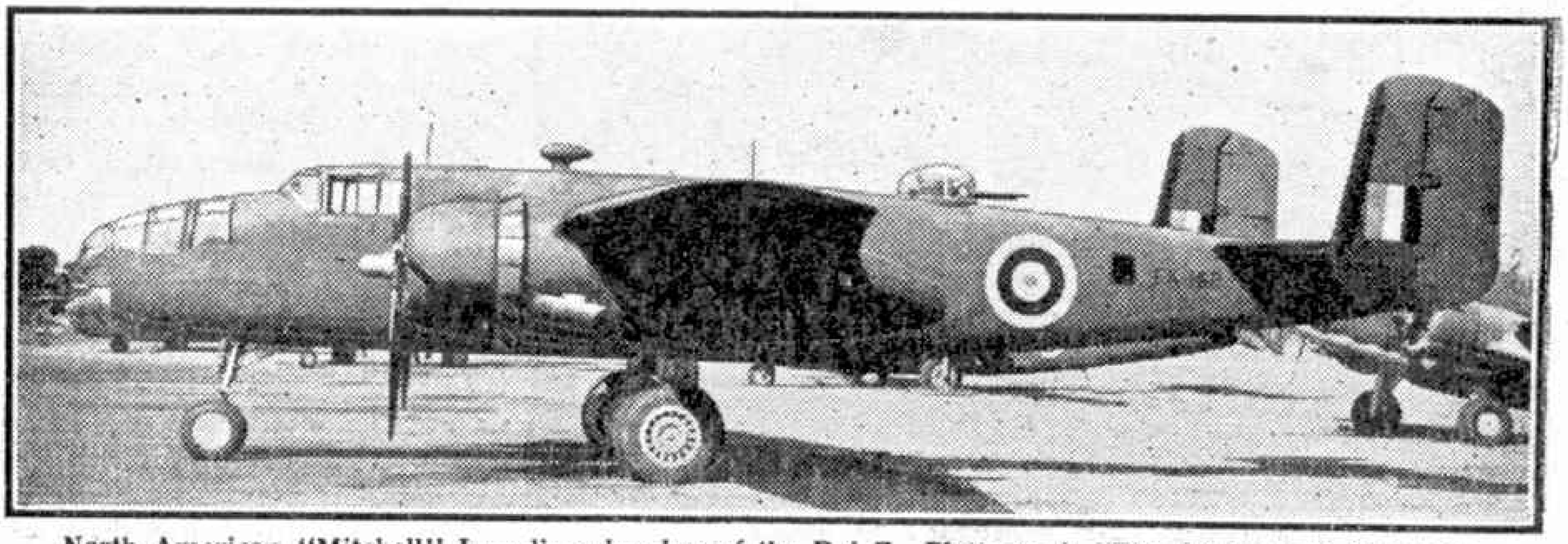
This is only one of the many duties of this Unit, official details of whose work were released last month.

The Unit consists of a Wing divided into Squadrons, and is under the operational control of Coastal Command. Its pilots use special photographic reconnaissance versions of the "Spitfire" and "Mosquito" aircraft, fitted with long-range fuel tanks, and fast enough to escape from any Messerschmitt Me 109s or Focke-Wulf Fw 190s which may pursue them. Most of the marvellous cameras used for this work are F.52 telephoto lens cameras with a focal length of 3 ft., and much of the photography, especially of large, heavily-defended targets, is done from a great height.

* * * *

A new "super fighter" which will be known as the Grumman "Hellcat" and has been developed from the company's "Wildcat" single-seat fighter is in production for the U.S. Navy. No details of the new machine have been revealed other than a statement that it will be heavily armed with 0.5 in. machine guns.

The "Martlet" fighter used by the Fleet Air Arm is a version of the "Wildcat."



North American "Mitchell" I medium bomber of the R.A.F. Photograph "The Aeroplane" Copyright.

Locomotive War Babies

This article, by Lawrence W. Sagle, Public Relations Representative, is reproduced from the "Baltimore and Ohio Magazine" by courtesy of the Editor.

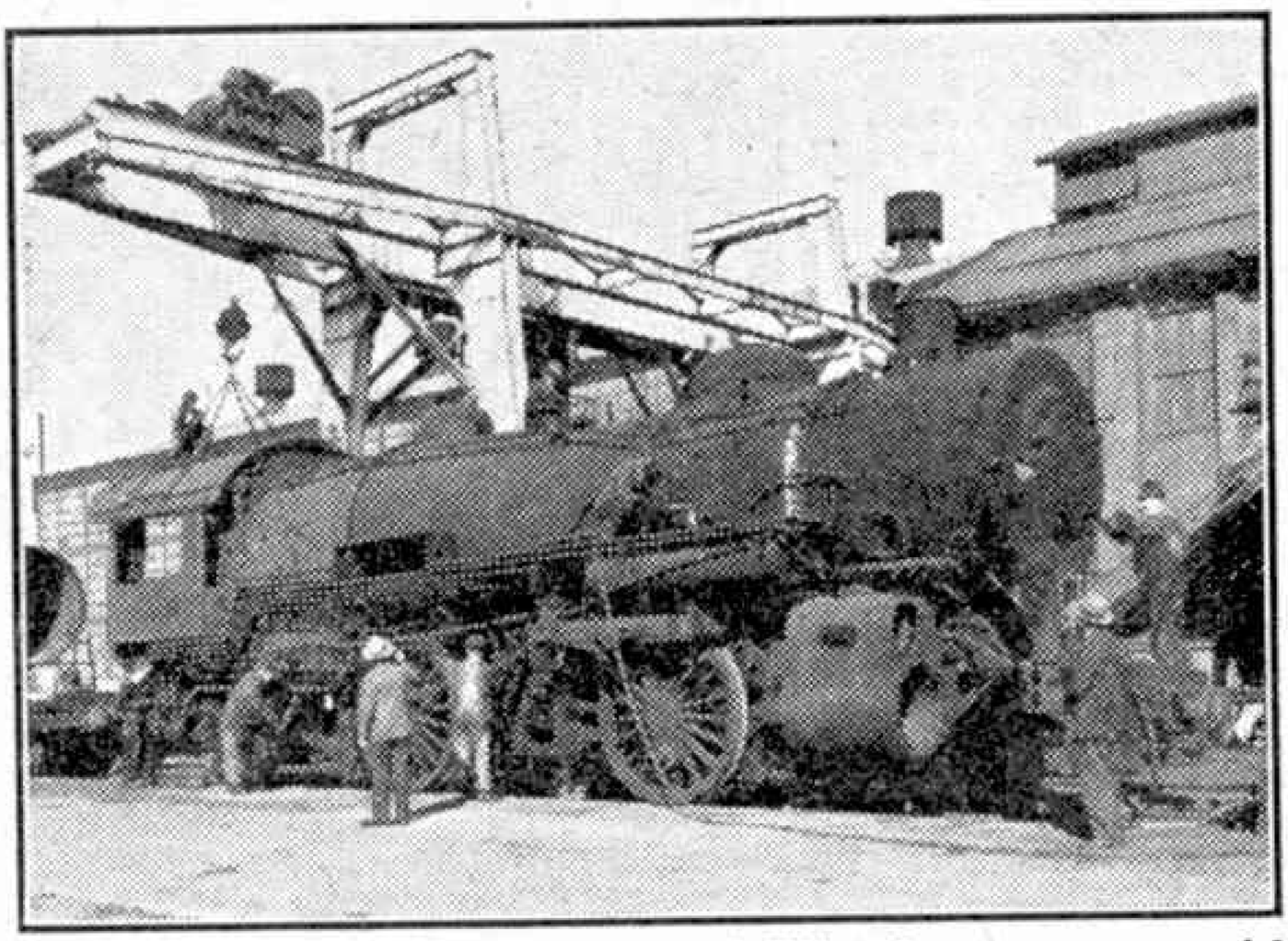
IT is no longer news that the United States railroads are handling the largest volume of traffic in their history with 9,500 fewer locomotives and 500,000 fewer freight cars than they had in service during the last war.

Only swift and steady increase in operating efficiency has made this possible. In 1921 each serviceable freight car travelled on an average 25.8 miles per day. This had increased to 43.7 miles per day in 1941. The average freight train in 1921 consisted of 37.4 cars, carrying 651 tons of freight, while in 1941 the average number of cars per train had increased to 50.3, and the average tonnage to 915. The average freight train speed in 1921 (including all stops) was 11½ miles per hour; this was increased to 16½ miles per hour in 1941.

This increased efficiency has been the result of wise planning on the part of the railroads, even during the heart-breaking years between 1929 and the outbreak of war. There was a surplus of locomotives, so the older ones were scrapped. Only the more efficient were retained—big ones that could haul the most cars and heaviest loads. Fewer trains of larger capacity was the rule. Cars, too, of lighter capacity found their way to the scrap pile.

However, many roads, like the Baltimore and Ohio, kept some of their older locomotives in reserve, since they were basically good, and capable of being modernised and improved.

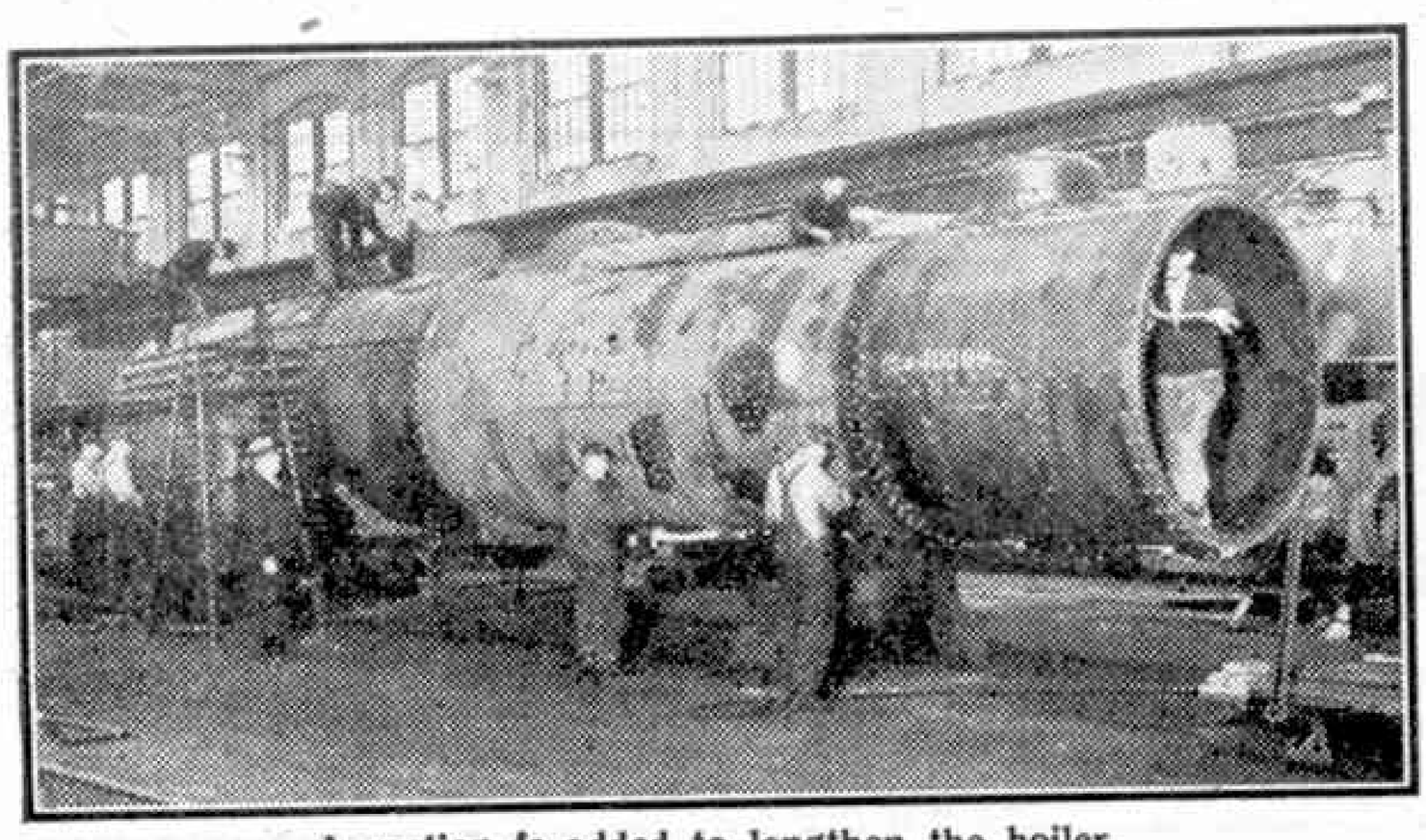
Railroads have always tried to increase



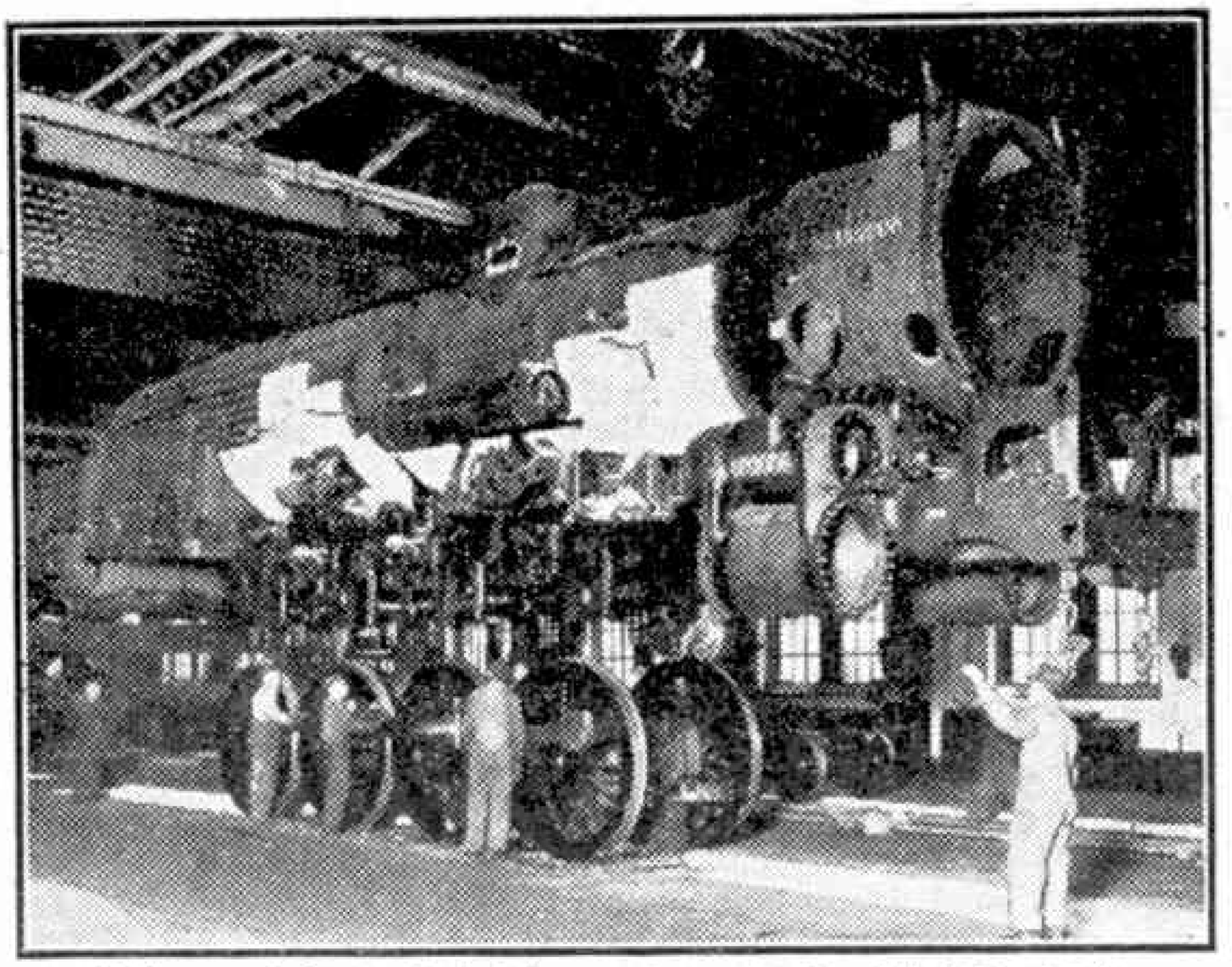
Dismantling a 2-8-2 engine prior to rebuilding it as a more powerful 4-8-2 "Mountain" type.

train-loads and thus reduce unit tonnage costs. Otherwise they could not have met increased wage and material costs and stayed in business. They were truly up against it, because they had to pay all their costs while their competitors—trucks, buses, aeroplanes and inland waterway carriers—were subsidised by the Government. It is more economical to use 100,000-pound capacity freight cars than the older 60,000-pound capacity cars; and freight trains of 80 to 100 cars instead of trains of 40 to 60 cars. And locomotives must be more powerful to haul such trains—and yet, by more efficient design, to keep fuel consumption from increasing in the same ratio.

The Baltimore and Ohio badly needed such locomotives, yet the War Production Board permitted us to take delivery of only nine of 23 new locomotives ordered in 1942. Modernisation of older locomotives



A section is added to lengthen the boiler.



Boiler and frame being lowered on to the driving wheels.

was the answer.

On the Chicago Division we have been using heavy locomotives of the 2–8–2, or "MacArthur" type, for handling all important freight trains. By increasing the tender capacity on one of these engines and adding an auxiliary water tank, increasing the coal capacity from 17½ to 32 tons, and water from 12,000 to 29,000 gallons, it was possible to operate the engine between New Castle, Pa., and Chicago in less time because of the elimination of intermediate coal and water stops between division points.

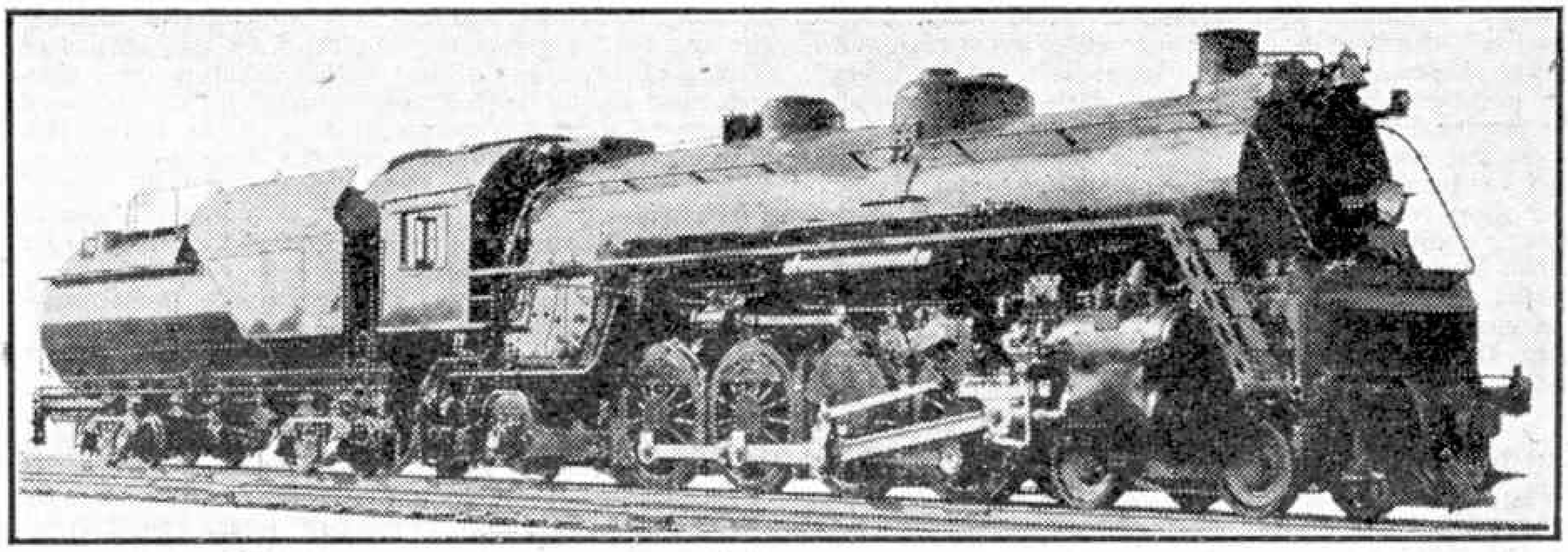
But this alone did not solve the problem. These "MacArthurs," built in 1920 to 1923, have 64 in. driving wheels. As average speeds and tonnage ratings for QD freights steadily increased, the "MacArthurs" had to work harder and faster, and maintenance costs went up because of the need for more frequent running and heavy repairs.

In an attempt to find a solution for the high maintenance costs, one of these locomotives, built in 1923, was modernised by reboring the cylinders to 26½ in. by 32 in. instead of 26 in. by 32 in., increasing the boiler pressure from 220 to 240 pounds, and by substituting 70-in. in place of 64-in. drivers, which, with improved counterbalancing, increased the efficiency of the engine and raised the tractive effort from 63,200 to 65,500 pounds. Oil lubrication was provided for all driving journals, and a lateral cushioning device was applied to the rear driving wheels to enable the engine to negotiate curves more easily. With larger tender and auxiliary tank, this engine was subjected to exhaustive tests with the dynamometer car, and the results were very satisfactory. In consideration of the increased speed, efficiency, and lower maintenance costs, it was decided to similarly change other locomotives.

Therefore, three more locomotives were chosen, but of an older type, built 1911 to 1913. These were awaiting shop for first-class repairs and required new driving wheels, frames, cylinders, and, in some cases, new fire-boxes. In the case of these locomotives, the cost of modernisation was less than in the first case, since they were already due for extensive overhauling.

These four locomotives have justified the extra expense of modernising them, and are doing a good job on the Chicago Division.

Twenty more locomotives are now being modernised. These have been selected, also, from the Q-1aa locomotives, built in 1911–1913, all of (Cont. on page 358)



The rebuilt "Mountain" type locomotive ready for the road.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, we can supply copies of these books to readers who cannot obtain them through the usual channels. Order from Book Dept., Meccano Limited, Binns Road, Liverpool 13, adding 6d. for postage.

"ELEMENTARY HANDBOOK OF AIRCRAFT ENGINES"

By A. W. JUDGE (Chapman and Hall. 12/6 net)

Knowledge of aircraft engines is a necessity for thousands of readers of the "*M.M.*" and of the greatest interest to all of them; and here is a book that will meet their needs. Mr. Judge is a practised writer on internal combustion engines in general, and here he explains clearly and concisely, for aircraft mechanics, members of the A.T.C. and students generally, how those used in modern aircraft work and are built. As far as possible mathematics is kept out of the story, essential calculations and formulæ being given in an appendix; and excellent use is made of nearly 200 well-selected illustrations, both in half tone and in line.

Mr. Judge begins with the general consideration of aircraft engines, their types and maintenance, passing on to general principles and their practical interpretation. How the engines are fed with petrol is then dealt with; supercharging, so important for efficiency at great heights, is thoroughly explained, and methods of cooling are well described. Then we come to the more practical side with a chapter on main components, from cylinders, pistons and piston rings to silencers and mountings, with typical examples from engines of all kinds.

The various types and their applications are then described, from the 50 to 100 b.h.p. engines suitable for light touring aeroplanes to the high-powered giants required for multi-engine commercial aircraft and for fighters and bombers. In-line, V and H engines and huge radials are all dealt with, including the modern sleeve valve engines developed by the Bristol Company; and their advantages fully explained. Finally we come to chapters on lubrication and ignition, engine starting and testing, and maintenance. An appendix gives technical details of a large range of British aircraft engines.

Owing to wartime difficulties, it is impossible to guarantee prompt delivery of books ordered as described at the head of this page, but every effort will be made to ensure speedy despatch.

"THE A.B.C. OF GREAT WESTERN LOCOMOTIVES"

(I. ALLAN, 225-7, Laleham Road, Staines. Price 1/6)

This is the second of Mr. Allan's projected series of booklets similar to "*The A.B.C. of Southern Locomotives*," the fourth edition of which was reviewed in the September "*M.M.*" In it the author gives the numbers, with names where these apply, of all the locomotives now in use on the G.W.R., arranged in classes, with general details of each class. In the case of locomotives formerly owned by the Barry and other railways now included in the G.W.R., the owning company also is clearly indicated.

The booklet is now in its 2nd and fully illustrated edition, and in this form will be welcomed by all locomotive enthusiasts. It can be obtained direct from the author, at the address given, price 1/8 post free.

BRITISH LOCOMOTIVE TYPES

(The Railway Publishing Co. Ltd., London. Price 8/-)

The fifth edition of "*British Locomotive Types*" forms a most useful and convenient source of reference for the more serious enthusiasts, model-makers and locomotive engineers and students. It does not deal with "name and number" topics, but presents 127 line drawings, with the principal dimensions, of engines varying from giant "Pacifics" to dock shunters. The book does not aim at giving details of all the types in use, however, but what may be regarded as standard engines on each line are included, as well as a fair number of rebuilt or reconstructed classes.

Among the new engines featured for the first time are the "Merchant Navy" 4-6-2s and the "Q1" 0-6-0s of the S.R.; the workmanlike "Antelope" 4-6-0s of the L.N.E.R.; and the various war service designs, both British and American, of the Ministry of Supply. In addition there are the L.M.S. "5XP" design as rebuilt with larger boiler, increased pressure and double chimney, and the L.N.E.R. "Q1" 0-8-0Ts developed as reconstructions from the old Great Central 0-8-0 tender design. Since the original diagrams were made and published in "*The Railway Gazette*" certain changes have been made in many of the older types; where these have not involved any great difference in the externals they have been mentioned in a footnote. At the same time descriptive matter under the diagrams has been revised in accordance with the latest particulars.

The table of contents makes it possible to refer quickly to any of the diagrams included and ready reference is made easier by the fact that the page numbering has been revised to do away with the suffixes used in previous editions for new diagrams.

The quality of the book is excellent, and ability to stand constant handling is assured by the use of good stout boards for the covers.

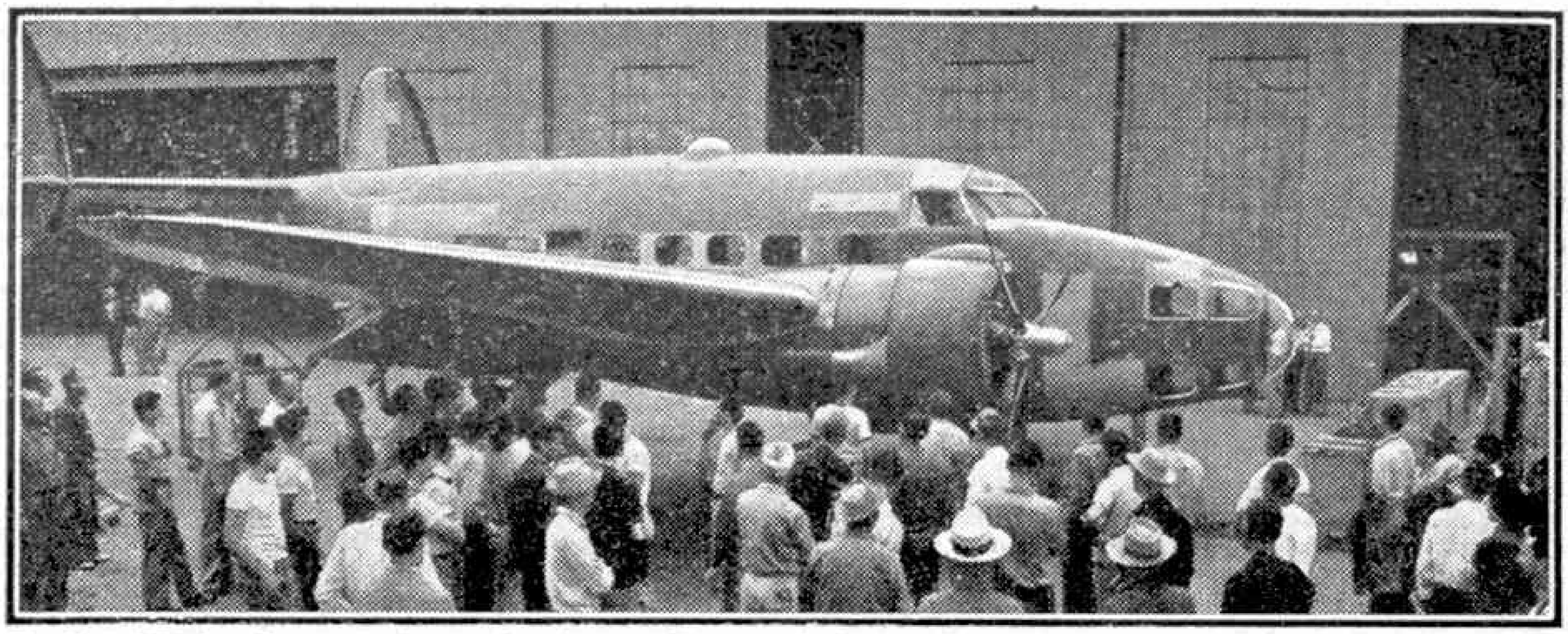
"THE NEW HOME PORTRAITURE"

By HENRY G. RUSSELL, A.R.P.S.
(Fountain Press. 10/6 net)

For the amateur photographer who wants to take good portraits, here is a book that will show him how to secure very fine results at home with modest equipment. Mr. Russell explains matters in very simple terms. Beginning with the camera and other requirements, he explains the best ways of dealing with various types of model, the most effective means of lighting to produce various results, and the use of filters. The reader is then taken step by step through the process of producing portraits by daylight, and with artificial lighting, first with one lamp, then with two, and finally with three. A portrait should be a picture as well as a representation of the sitter; this is attained by careful composition and the rules on which this is based are clearly described.

Mr. Russell shows also how to construct useful accessories, all made of simple material easily obtainable, and has valuable advice on development, printing and mounting. Trimming is dealt with effectively, and its value is made abundantly clear by many excellent examples in which the finished portrait is compared with the original contact print.

The pages of Mr. Russell's book give ample evidence of the correctness of his claims and methods, for it is illustrated with a wealth of highly successful portraits of all types that he has made with the equipment he describes. Altogether there are over 130 helpful photographs and diagrams illustrating lighting and the making of accessories.



The last "Hudson" reconnaissance-bomber outside the Final Assembly hangar. Photographs by courtesy of the Lockheed Aircraft Corporation, U.S.A.

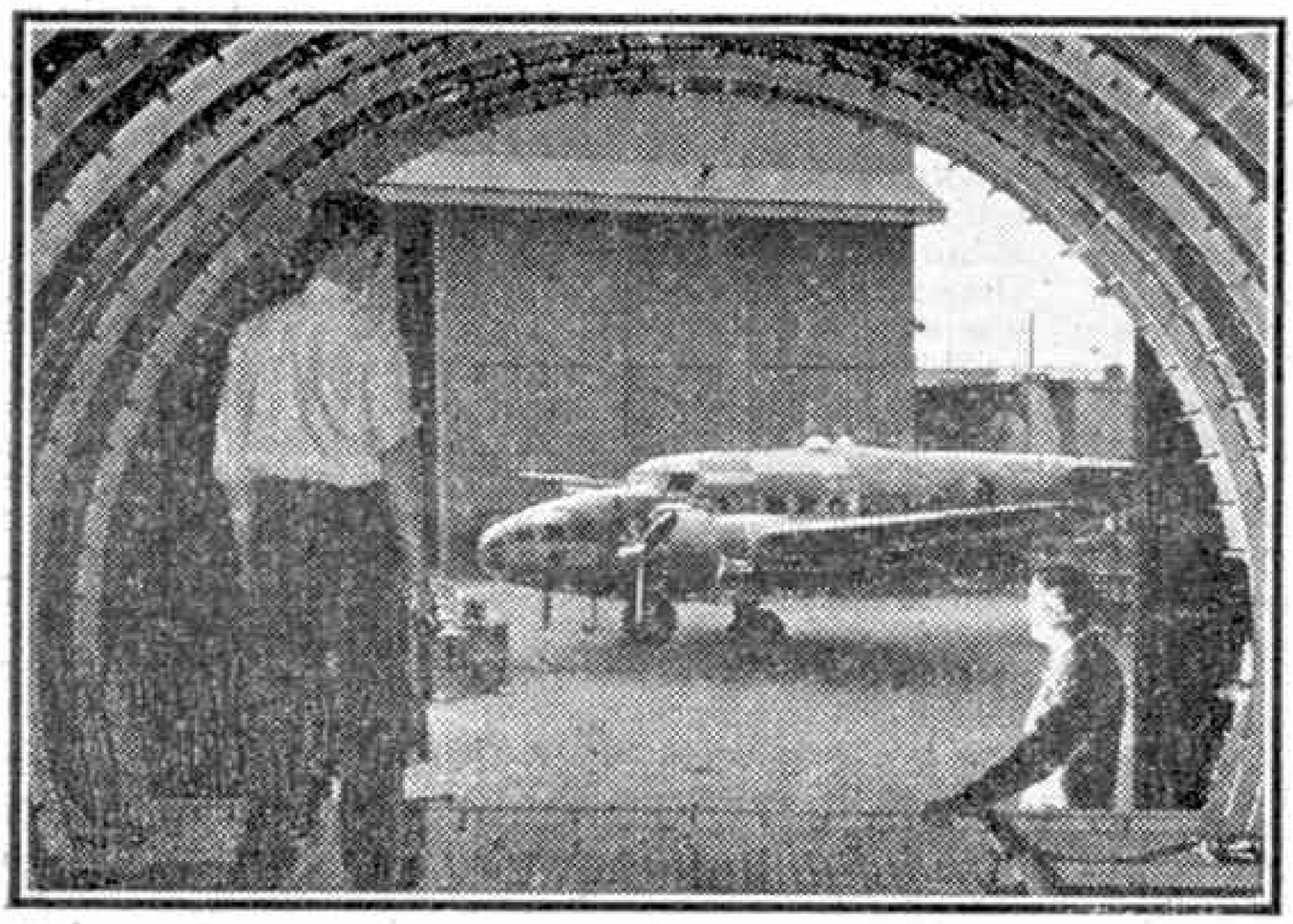
The Last "Hudson" Bomber

SPECIAL interest attaches to the recent completion of the last "Hudson" bomber at the Burbank factory of the Lockheed Aircraft Corporation, U.S.A., as "Hudsons" were the first American military aircraft to go into service with the Royal Air Force.

The "Hudson" is a military version of the Lockheed 14 civil transport. It was accepted for the R.A.F. in 1938 after a British Air Mission had inspected and approved a complete mock-up of the proposed bomber, constructed by Lockheed technicians in the remarkably short time of 10 days. An initial order for 200 of the bombers was given to the company, and delivery to the R.A.F. began early in 1939. From then until June this year the "Hudson," as the new reconnaissance-bomber was named, was in constant production, and thousands of these machines have been built. Until the ferrying of Lockheed "Lightning" fighters became standard practice more "Hudsons" had flown the Atlantic than all other aircraft types combined, and to-day they are being used by British, American, Canadian, Australian, Chinese and other Air Forces of the United Nations.

The "Hudson" was designed chiefly for reconnaissance and patrol duty, but it has also given a good account of itself as a medium bomber and dive-bomber. Aircraft of this type have been operated by Coastal Command, R.A.F., since the beginning of the war, and have flown millions of miles on reconnaissance and bombing sorties, mainly over the North Sea and Atlantic. They have often returned to base bearing evidence of sharp encounter with the enemy, and an instance of this was described and illustrated in the "*Air News*" pages of the May "*M.M.*" this year.

These aircraft have taken part in many thrilling incidents of the war. It was a "Hudson" of Coastal Command that on 16th February 1940 discovered the German prison ship "*Altmark*" off the Norwegian coast, and after the ship had been boarded in a fjord by men of H.M.S. "*Cossack*" and the British prisoners rescued, "Hudsons" acted as air escort to the "*Cossack*" and other warships on their homeward journey. "Hudsons" in the role of dive-bombers took part in the Dunkirk operations in May-June that year, and in 1941 other machines of this type helped in locating and shadowing the German battleship "*Bismarck*" after she had rashly ventured out of home waters on the foray that ended in her destruction. On 27th August 1941 a "Hudson" on patrol from Iceland made history by disabling a Nazi submarine by bombing, strafing it until the crew surrendered and enabling it to be captured intact by a destroyer later sent to the scene. In the victorious North African campaign "Hudsons" gave valuable service carrying supplies of water, ammunition, fuel and other essentials to the British Eighth Army during their long pursuit of Rommel.



The machine seen through a section of the fuselage of a Lockheed "Constellation" air transport.

The "Hudson" is a comfortable machine to fly, as having been developed from a civil transport design it is more roomy than most bombers of its size. Normally the crew total five, and the bomb load is carried in the centre section of the fuselage. It is armed with six guns, one a fixed weapon firing forward from the nose, two in a turret on top of the fuselage and fairly near the tail, another in the underside of the fuselage, also near the tail and worked by a gunner in a prone position, and two in the cabin, one at each side, firing out of the windows.

Railway News

Centenary of Crewe Locomotive Works

Crewe L.M.S. Locomotive Works, the largest railway-owned and most famous engine building establishment in the world, is 100 years old this year. The whole history of the steam engine revolves round the name of Crewe. Engineers trained there have established British locomotive tradition in the four corners of the globe, and the long line of famous engines designed and built at Crewe has blazed the trail in world locomotive development.

Many famous engines have been included in the 6,623 built at Crewe since 1843. Among them are "*Columbine*," Crewe's first engine, now in York Railway Museum; "*Lady of the Lake*," Gold Medallist of the 1862 International Exhibition; "*Hardwicke*," which took a prominent part in the 1895 race to Scotland, attaining an average speed of 67.2 m.p.h.; "*Charles Dickens*," which travelled a million miles in 10 years, and had a total mileage of 2,345,107; "*Princess Elizabeth*," which made record runs between London and Glasgow in 1936; and "*Coronation*," which toured the United States and in 1937 created a world's non-stop run record.

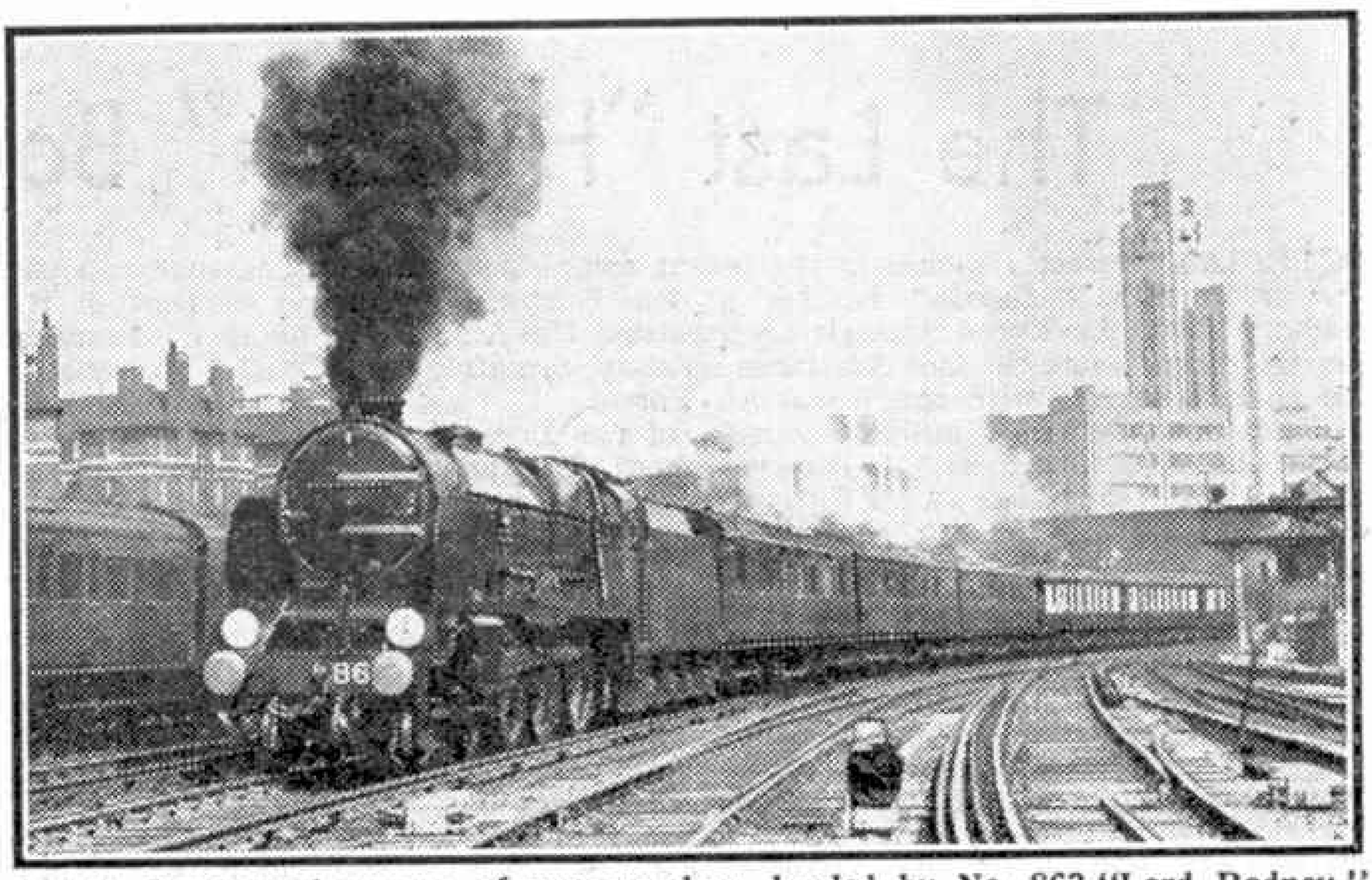
Other things are done at Crewe besides engine building. Its large staff of men and women are also engaged on repairing 2,000 locomotives a year, and the making of points, crossings and signals, and the repair of L.M.S. docks and harbour plant are other activities of this modern railway hive.

The "Golden Arrow" Express Service

One of our illustrations this month shows the 11 a.m. "*Golden Arrow*" Continental express leaving Victoria, London. It is seen climbing the sharp rise to Grosvenor Bridge at the beginning of its 95-minute non-stop run to Dover, hauled by a "Lord Nelson" 4–6–0 fitted with a large chimney and painted in the latest pre-war style.

This train, in conjunction with its French counterpart "*La Fleche D'Or*" and the new steamer "*Canterbury*," provided a fast and luxurious day service between London and Paris. The French express was composed entirely of Pullman cars for most of the time it ran, although during the slackest parts of two winter seasons through sleeping cars for distant points on the Riviera, in Italy and the Near East were conveyed between Calais and Paris. These made up a heavy train with which magnificent work was done by Nord "Super-Pacifics," averaging well over 60 m.p.h. along most of the route between Paris and Boulogne, which was the Channel port used by the westbound service in the later peacetime years. In the opposite direction Calais was the French port.

On the Southern Railway the "*Golden Arrow*" was originally formed of first class Pullmans only, though this plan was soon replaced by a formation of first and second class corridor coaches, with three or more Pullman cars in the centre of a handsome train. The inward express in 1938–9, up to the outbreak of war, after being drawn up from the pier by two small tank engines, left Folkestone Junction, if the steamer had arrived sufficiently punctually, at 3.54 p.m., and arrived at Victoria at 5.20, in charge of the same "Lord Nelson" that had worked the 11 a.m. down to Dover.



A S.R. Continental express of pre-war days, hauled by No. 863 "Lord Rodney."

Fast Running by "Sir Francis Drake"

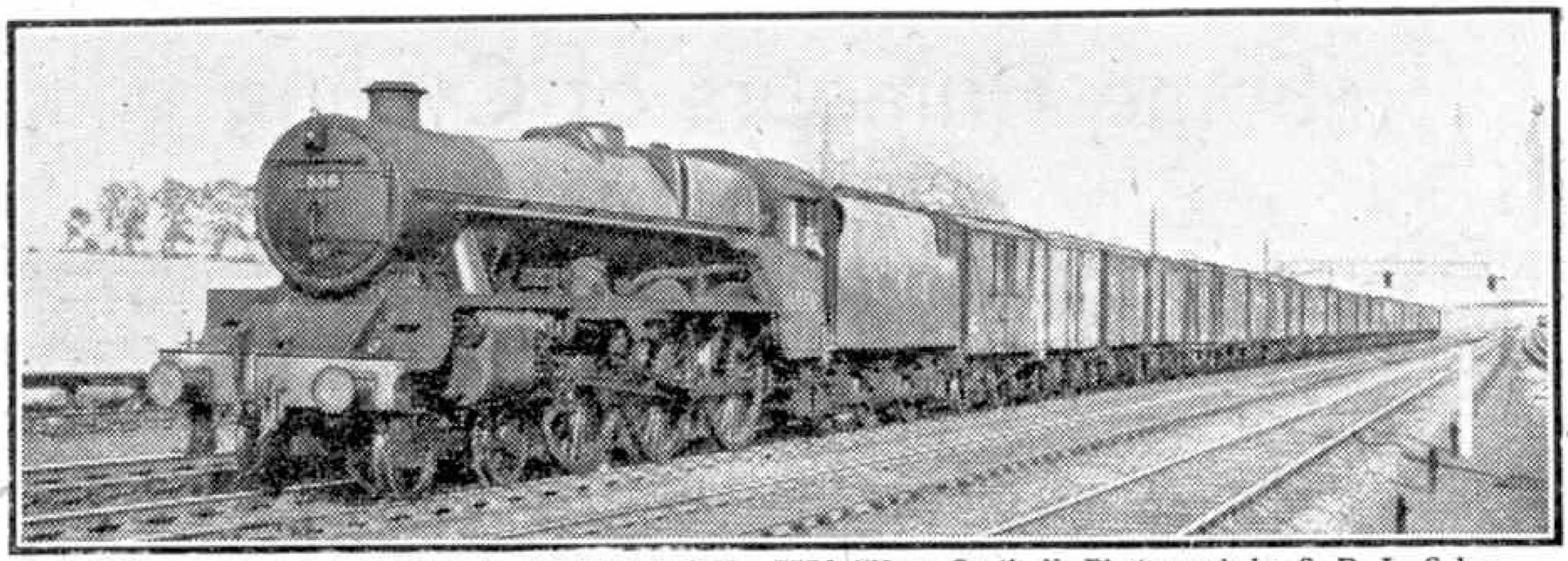
No. 851 "*Sir Francis Drake*" is the second of the S.R. "Lord Nelson" 4-cyl. 4–6–0 class. This locomotive is now fitted with multiple jet blast pipe, large chimney and modified cylinders, but retains 8 in. piston valves, whereas some of the "Lord Nelsons" have had their modernisation completed by the provision of larger diameter 10 in. valves; others still have original cylinders and valves, though all now boast large chimneys and new blast pipes.

Two recent trips behind No. 851 on Waterloo-Bournemouth expresses were distinguished by fast wartime running along the Woking-Basingstoke stretch, which is straight and easily graded. Going down with 440 tons full, a fair start was made from Woking up the gradual rise to mile-post 31, and thereafter speeds between 66 and 77 m.p.h. were sustained almost to Basingstoke, well up the 1 in 250, so that although the tendency in this direction is against the engine the 26 miles to Worting Junc. took only 28 min. Things were taken easily down the long, tempting descent past Winchester and Eastleigh; nevertheless, after a relaying slack, the next stop at Southampton was reached 4 min. early in 62 min. net for 54¼ miles from the restart at Woking.

With a full London-bound train of 14 corridors, weighing 490 tons gross, "*Sir Francis Drake*" was logged from Winchester start, where the express was running late. Up the long 1 in 250 rise to Litchfield speed was rather below some "Nelson" efforts, the minimum being just under 40 m.p.h., so that the allowance of 23 min. to pass Worting Junc. 16¼ miles, was exceeded by 2½ min. Here the West of England and Bournemouth main lines unite, and there are four tracks continuously thence over the 50½ miles to Waterloo. From passing Worting Box to stopping at Woking the allowance is only 26 min. over a distance of almost 26 miles, but that morning, in galloping peacetime style, only 22 min. sufficed! An average of 72.3 m.p.h. was sustained between mile-posts 49 and 26, and the actual start to stop time from Winchester to Woking, 42 miles, was 47 min. compared with the 49 allowed in the working schedule, so that some of the lost time had been made up.

Railway Fire Fighting Competitions

As part of the fire fighting equipment set up throughout the L.N.E.R. system, there has been provided a large fleet of power-operated trailer pumps manned largely by volunteer crews who



L.M.S. express train, headed by "5XP" 4-6-0 No. 5556 "Nova Scotia." Photograph by C. R. L. Coles.

have reached a high state of efficiency. Now they are to have an opportunity of displaying their prowess in competitions organised by each of the three main areas. The winning teams from each section will meet in a final competiton and prizes will be awarded.

New and Rebuilt L.M.S. Locomotives

Four new streamlined "Pacifics" are now coming into traffic, painted black with standard numerals and numbered 6245–8. These were ordered in 1939 but work on them was suspended. No. 6245 was named "*City of London*" by the Lord Mayor at a ceremony at Euston.

More class "8F" 2–8–0s built by the S.R. are at work on the Western Division. Two, Nos. 8611 and 8628, were noted near Rugby double-heading a heavy goods train. New ones turned out from Crewe include Nos. 8170–2.

Several of the "Royal Scot" 3-cyl. 4–6–0 express locomotives are being completely rebuilt with tapered boilers like that carried by No. 6170 "*British Legion*," and also, it is understood, with modified blast pipes and double chimneys.

The tapered type of boiler was fitted in 1937 to the newest "Royal Scot" No. 6170, which engine was evolved from the experimental high-pressure 4–6–0 No. 6399 "*Fury*." It is slightly shorter than the normal boiler and contains rather less heating surface, though in conjunction with improved steam pipes and increased fire-box area it appears to steam well. No. 6170 achieved some excellent running results on the fastest Manchester-Euston expresses just before the outbreak of war.

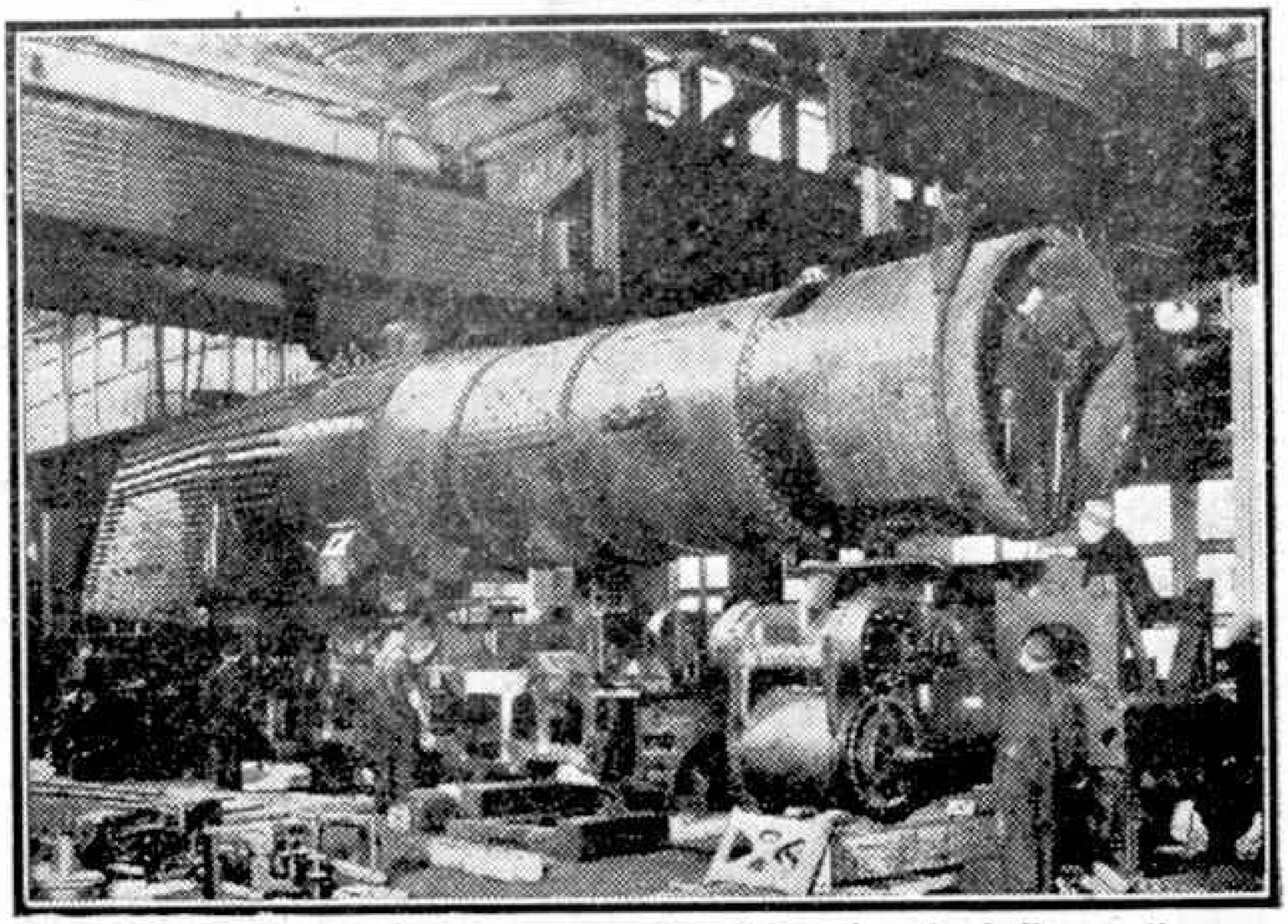
Although usually seen on the Midland Division since rebuilding Nos. 5735 "*Comet*" and 5736 "*Phœnix*," formerly of the "5XP" "Jubilee" 3-cyl. 4–6–0 class and now of "6P" class, the same as that of the "Royal Scot," have lately appeared on Glasgow-Ayr expresses, but they have since been transferred to Euston expresses. These two engines, which were rebuilt in 1942, present a striking and powerful appearance. Boiler pressure has been raised from 225 to 250 lb. per sq. in., and the boiler is of larger diameter, so that it has been possible to increase the number of flues and tubes as well as to provide an enlarged superheater; the combined heating surface is 2,219 sq. ft. compared with 1,948 sq. ft. on the standard "Jubilee" locomotives. The grate area of the two locomotives is the same as on "*British Legion*" and they are fitted with large chimneys with improved exhaust arrangements. The cylinders remain 17 in. in diameter, 1 in. less than on the "Royal Scots." In each case the stroke is 26 in.

Mobile Canteens Adapted from Containers

The feeding of large parties of railwaymen working on special "rush" repair or relaying jobs far from their homes presents difficulties in wartime, and a number of furniture containers that normally travel on flat wagons in goods trains have been adapted as kitchens, with service counters for meals and refreshments, for use on such occasions. Tanks for 50 gall. of water have been fitted, together with Calor gas cooking, lighting and heating equipment, bread slicing machines, racks for 70 one-pint mugs and other facilities for rapid service of emergency meals or snacks.

The Bell of "King George V"

Many fittings not regarded as essential in wartime are being removed from locomotives in the interest of standardisation and to make maintenance easier. We feared that the disappearance of the presentation American bell from the front of G.W.R. 4–6–0 No. 6000 "*King George V*," reported in the August "*M.M.*," was another such instance. We are glad to hear, however, that the bell has been restored to the buffer beam, following the "running-in" period after the engine had been in Shops this year.



"Locomotive War Babies" (see page 336). Mounting the boiler on the new frame. Photograph by courtesy of Baltimore and Ohio Railroad, U.S.A.

Some Humours of Cycling

By J. C. Bristow-Noble

WE all remember our first bicycles. I had mine when I was twelve. The back tyre was a pneumatic; the front a cushion. The old concoction cost me fifteen shillings. I had tried hard to get it for ten. I had sold ten shillings' worth of rabbits to raise that sum and did not want to sell an additional five shillings' worth. The seller protested that rather than take less than fifteen shillings for the bike, he would make a bird cage with the spokes and a halter for his bull of the rest.

I learnt to ride the death trap by mounting it on the top of a short, steep hill, and wobbling down the incline into a mossy bank. A couple of days of that and I regarded myself as an expert cyclist,

Busy bees!

and I think I must have been.

There was soon a nasty occurrence. In a week or so I found myself nearing a young horse that was being driven on the roads for the first time. The front wheel parted company from the rest of the bicycle and went careering on into the colt's legs. Meanwhile, of course, I was sprawled in the road. The steed bolted, the traces and the shafts of the trap snapped, and the conveyance was left in the road near me with the fuming, much bruised driver.

The bicycle and myself escaped serious injury, and as soon as I had retrieved the wheel and replaced it, I set off in chase of the colt. That got me away from the person, who by this time had crawled on to the grass verge, but was still raving.

The animal did not stop until he reached his home nearly six miles away; neither did I.

Another misfortune followed quickly. One of the handlebars of the bicycle suddenly snapped off. That meant another spill and a visit to a blacksmith, who sorted me out another pair from a stack of such fittings in a corner of his shop.

Gradually I was collecting another and better bicycle. The precious spokes of the original had nearly all gone, and others had been found for me by the same obliging blacksmith; also the pneumatic tyre, tube and all. I had sold a riding saddle to provide money for another tyre and tube. In the end I had a good four years' use out of that bicycle, or rather the frame. That was all that ultimately remained of the fifteen shillings' worth.

By that time a safe, serious bicycle had become a necessity. The Eastern Counties just then were my home. Not long afterwards myself and new bicycle got involved with a pair of horses that were drawing the fine carriage of a successful Parliamentary Candidate and his family through the streets of Lowestoft, to the accompaniment of the cheers of his people. I remember clinging to the neck of one of the splendid creatures to save myself from getting beneath their hoofs. A couple of policemen bravely sprang forward, and while one literally tossed me to the kerb, the other thoughtfully threw the bicycle after me, and "our member" and his lady, and sons and daughters, pale and looking much startled from the shock, gravely resumed their bows and smiles.

I had a flair in those early days as a cyclist for getting mixed up with horses. Once when riding past the Marble Arch in London, I skidded and fell beneath a pair harnessed to a bus. The creatures stopped dead and I came to no harm. On another occasion when riding through Winchester I collided head on with a pair drawing a brewer's dray. Again, I escaped

with only a few mild bruises. On yet another occasion, when riding through the night from London to Dorking, I actually fell over a horse lying, and I presume, dozing, across the road.

Once I barged into the mount of a master of a pack of hounds. The gentleman, in the excitement of a fast run, had suddenly and unexpectedly jumped the horse out of a meadow into the road in front of me, and the accident was unavoidable.

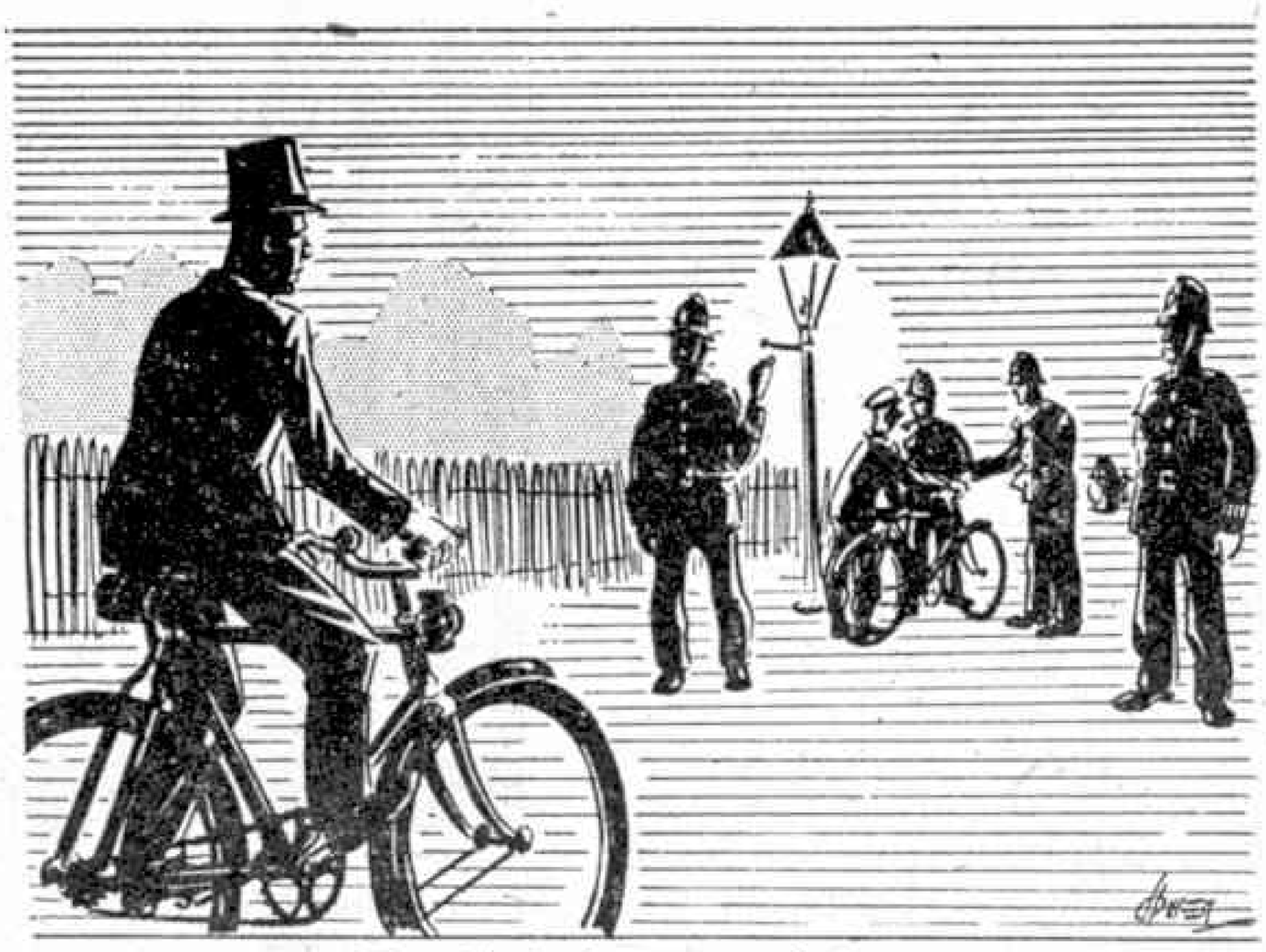
All these thrills occurred while I was still owning my second bicycle. At long last I lost that bicycle in a strange way. I had ridden on it from near Basingstoke to Ascot races, and parked it with many others in a shed near the course. When I went for it a good hour after the last race, there were only a few of the machines left in the building. I handed the attendant a numbered ticket I had been given in the morning, and he brought me an expensive new bicycle of the same make as my own. The number of the ticket pasted on it corresponded with the number of the one I had given up. I remarked that I had certainly parked a bicycle of the same make, but I thought not quite so splendid a mount.

The man then explained that while he himself, during the rush before the races, had numbered the bicycles, his mate, carelessly and in his haste, had doled out tickets from a wrong block, and that most of their patrons, among much unpleasantness, had left with bicycles that were not theirs. Certainly mine had gone, and as I had no desire to leave without one at all, I gave the greatly worried man my name and address and rode away on the new machine.

I never received news about my own, nor was the one I took ever claimed, and when at length I gave the latter away it had served me well for ten years.

Speaking of this incident reminds me of an experience with bees. An elderly, well-off acquaintance had bought a swarm, and, since I was something of a beeman, had asked me to oblige him by bringing it to his home from a distant cottage. I was cycling with the swarm in the usual straw skep—over which a cloth was tied—on my handlebars, and the man's daughter and her fiancé, both deeply interested, were riding one on each side of me. Presently the fiancé clumsily swerved against me, and all three of us crashed heavily. The cloth on the skep was torn, and though it was the twilight of the evening, many of the bees made their escape through the aperture, and attacked and stung us unmercifully.

Ultimately it was with barely half the swarm that we arrived at our destination. In a quarter of an hour or so, from an adjoining room in the home, I heard the daughter tell the father that the accident had not been my fault but that of her fiancé. "I can quite believe that," the old man raved. "I never knew you yet to engage yourself to a fellow with any sense, and there's a been a good many of them."



The effect of an opera hat.

One rainy day a ride from Banbury to Cambridge was made memorable by my coming across a tiny weasel fighting with a rat twice its own weight and size, in the centre of the deserted turnpike. I quietly got off my bicycle and from a distance of a few yards watched the contest.

The weasel, I thought to myself, must be beaten. But in a few moments it contrived to get a firm grip of the rat at the back of an ear, and thus locked together the two rolled over and over through the puddles and mud into the ditch. Then, presently, peeping among the foliage, I saw that the rat was dead, and that five barely half-grown weasels were helping the adult, which, of course, would have been their parent, to haul the body, little by little, into presumably the rat's own burrow, doubtless to consume it at their leisure.

A ride I used to (Continued on page 358)

Photography

Photographing Interiors

By A.R.P.S.

I WANT to take you this month into quite a different realm of your hobby. All summer you have been snapping various types of outdoor subjects; now let us turn our thoughts and lenses towards interiors.

Some of you may be living in cities where there are beautiful cathedrals or other great buildings; others may be in districts where there are fine specimens of parish churches. All of these offer splendid opportunities for the making of really good pictorial photographs, and so I strongly advise everyone to spend a little time and a few films on this work.

I am not going to try to give any definite suggestions as regards exposure, for obviously this must vary very greatly in different buildings and different parts of the same building. An exposure meter or calculator is really necessary. The lighting during October is on the "soft" side, and generally is at its strongest between 11.0 a.m. and 3.0 p.m. I suggest that you should keep to the Ultra-rapid or Extra-rapid grade of films. For most interior work you will find a small stop is necessary, and the shutter must be set for a "time" exposure.

A cathedral interior. Photograph by John J. Curtis. The upper photograph of a font is by P. Hampton Smith, Bickley.

A Lakeland church. Photograph by E. Miller, Liverpool.

If you have the time, you will find it useful to make a general survey of the building, noting which views appeal to you and getting your eye accustomed to the light. You will find a tripod very necessary, but failing this you can often make use of a chair or other firm support. Should you find other folks walking about, do not let this disturb you, for with a time exposure they are not likely to appear on your negative so long as they keep moving. But you must watch them, for if they happen to stand still right in the line of your camera and the object you are photographing, you must close the lens, and finish the exposure when they have moved away. Take very great care not to move the camera in this process.

In addition to general views very attractive pictures can be made of details of carving.

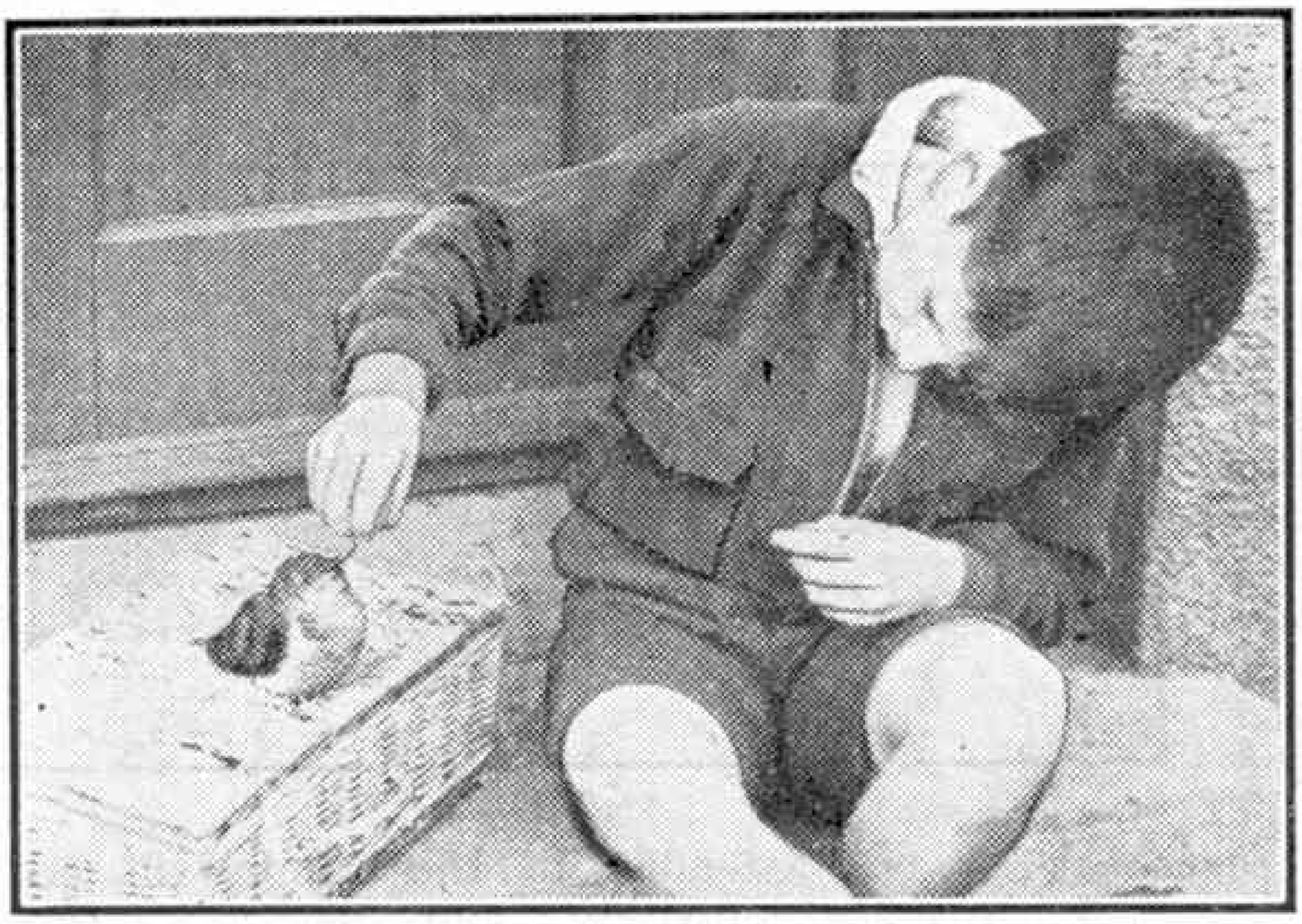
Finally, be sure to keep the camera level, otherwise you will find that the pillars in the picture seem to be falling in on each other, to the ruin of the photograph.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A YOUNG CUCKOO AS A PET

When sitting one evening in the car by a heath, I was told that a skylark had flown up not far away. We searched around for its nest and soon found it, with four darkish brown eggs. On looking more closely we noticed that one egg was larger and paler in colour and decided it was a cuckoo's egg. We kept watch on the nest and found that it hatched out nearly a week later. The young intruder grew very quickly and one morning we found the three baby skylarks stiff and stark outside the nest on the dewy grass. We visited the nest again in the evening and then the three dead nestlings and the young cuckoo had all disappeared, most likely carried off by carrier crows or the red backed shrike or butcher bird, as I knew a pair were nesting in the vicinity.



An unusual pet. Michael Garrish, Whiddon Down, with his young cuckoo. Photograph by S. S. Pethybridge, Newton Abbot.

In some ways this was a just retribution on the young intruder, but I was disappointed, as I particularly wished to photograph a young cuckoo. Later in the season an acquaintance casually mentioned that for two seasons a young cuckoo had been hatched and reared by a robin in his garden. Then one of his sons, knowing I was interested in birds, proudly brought in one evening a small wicker covered basket, in which was a nearly fully grown young cuckoo, and next day I got my photographs. The boy was very proud of his pet. It was fed on caterpillars, the normal food of the bird, but it died a few days later; cuckoos are difficult to rear in captivity.

S. Pethybridge (Newton Abbot).

ANCIENT ARCHES ACROSS MODERN HIGHWAY

For one side of a modern double road to be spanned by two archways from an ancient abbey may seem to be a little strange in these days, when so many old buildings have had to be sacrificed in order to construct an adequate road system for present-day traffic needs. Such a queer combination of old and new can be seen at Sawley, near the Lancashire and Yorkshire border, where two arches from the nearby ruins of the Cistercian Abbey of Sawley sit astride the main road from Clitheroe to the West Riding of Yorkshire. The portion of the road that passes under the arches is the original highway; that on the right of the photograph has been added to cope with the requirements of modern transport. R. Rowson (Liverpool).

LISBON AIRPORT

Lisbon, the capital city of Portugal, is one of the most fascinating spots of the present day, for it is the bottle-neck of Europe and a hive of refugees, and spies. I was born and brought up on the outskirts of the city at the famous "Clipper" base of Cabo River. Every evening I would climb a large water-filter tower in our garden and watch an incoming machine fly low overhead. The airport itself was a hive of activity with British, Italian, German and American flying boats lying side by side.

I have often gone down to the water's edge to inspect the flying boats at close quarters. The one that has always impressed me most is the "*Dixie Clipper*" of Pan American Airways, a sister ship of the famous "*Yankee Clipper*," which is also a regular caller. It is indeed a luxurious aircraft with every possible convenience for air travel, including bunks, a kitchen, lounge and seating cabin. The pilot, co-pilot, radio engineer and navigator are all accommodated on a spacious upper deck.

Cabo River is in itself a small place, consisting of our own house and a large British cotton printing mill in the same grounds, a railway station, and a few workers' houses. The recent opening of the large land airport near by and the sea-port I have described are quickly making it important.

L. J. Rankine (Hamilton).

The Abbey arches, Sawley. Photograph by C. R. Rowson, Liverpool.

Suggestions Section

By "Spanner"

(616) Built Up Meccano Cranks

("Spanner")

Cranks of different types are required in a large variety of Meccano models, and fortunately there are many methods by which they can be assembled from Meccano parts. Some of these are illustrated in Fig. 616 on this page and these will serve to give model-builders guidance in tackling this job themselves.

The three examples shown in the lower row in the illustration make use of Collars as their chief components, and it is an easy matter to arrange these to give cranks of various strokes. In the crank shown at the left of the row, the Collars are arranged to give as short a stroke as possible, while in the centre is a crank of longer throw. In this case the crank webs are provided by Screwed Rods, which are locked into the Collars by Nuts. In the example shown at the right end of the row the Collars are locked together on Grub Screws.

Couplings are useful when a crank of longer stroke is required, and two types built with these parts are shown on the right and left of the upper row in the illustration. The crank at the right consists simply of two Couplings carrying Rods in their end holes. The Rods can be of any suitable length. The Crank at the left of this row has an extended stroke, which is arranged by locking a Handrail Support in one end of each Coupling. These serve to hold a short Rod forming the crank pin.

The crank shown in the centre of the top row is a very robust structure suitable for use where considerable power has to be transmitted. In this case the webs are formed from Cranks, two of which are required for each web. The Cranks are placed in pairs back to back and are bolted together as shown.

In assembling all of the cranks illustrated care should be taken to make sure that the webs are in exact alignment. If this point is not attended to the crank will not operate smoothly, and the parts will gradually work loose, owing to excessive vibration and unequal strain.

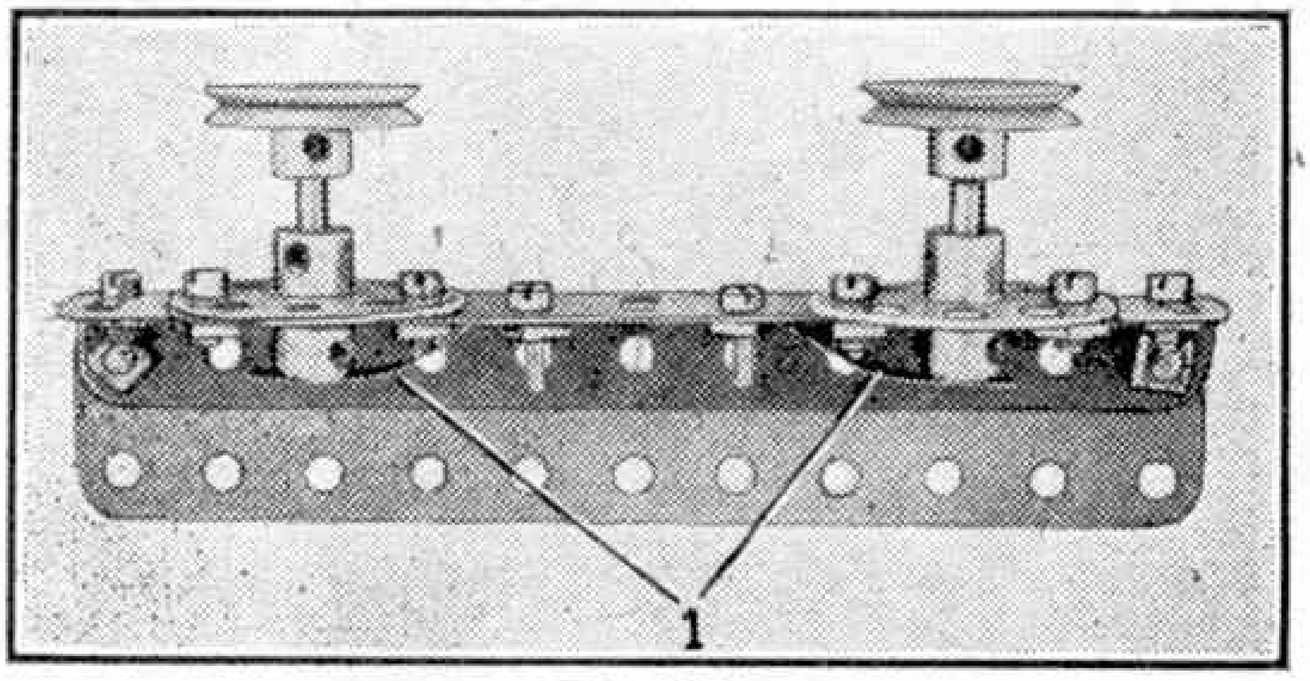


Fig. 617.

(617) A Novel Buffer Beam

("Spanner")

A buffer beam suitable for incorporation in large model travelling cranes, locomotives and similar models is illustrated in Fig. 617 on this page. It consists mainly of two 1" Pulleys forming the buffer heads, which are fixed on the outer ends of two 1" Rods. These Rods are journalled in Bush Wheels bolted to the beam, which is built up of 5½" Angle and Flat Girders bolted together to form a compound

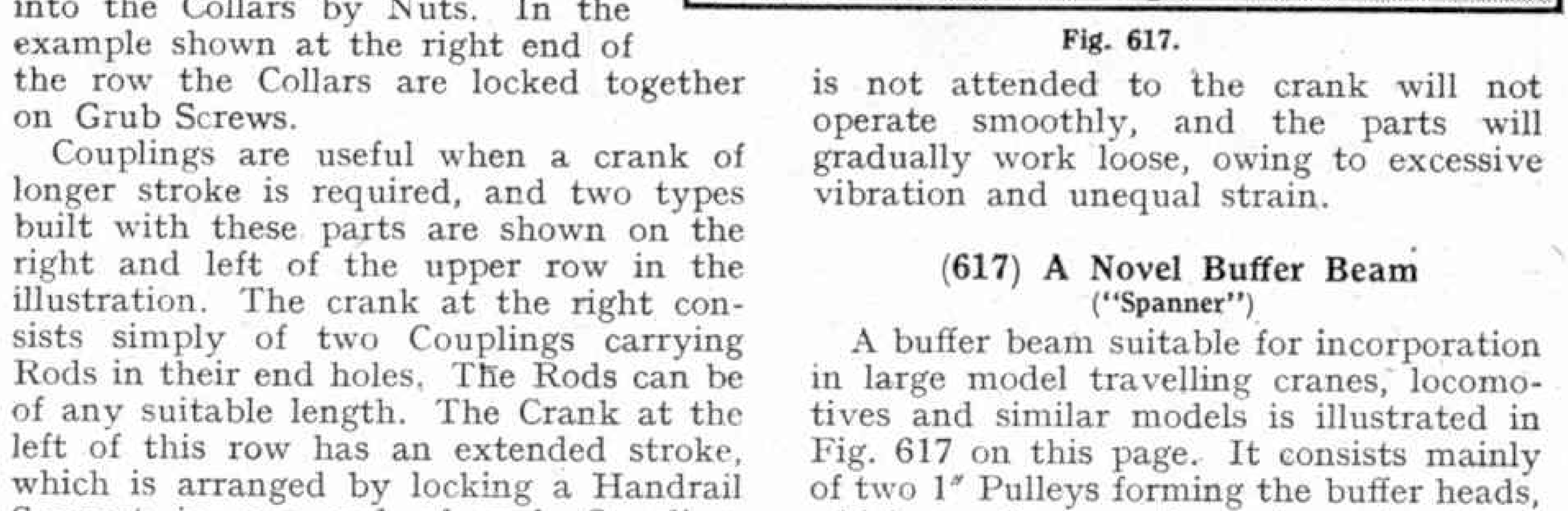


Fig. 616.

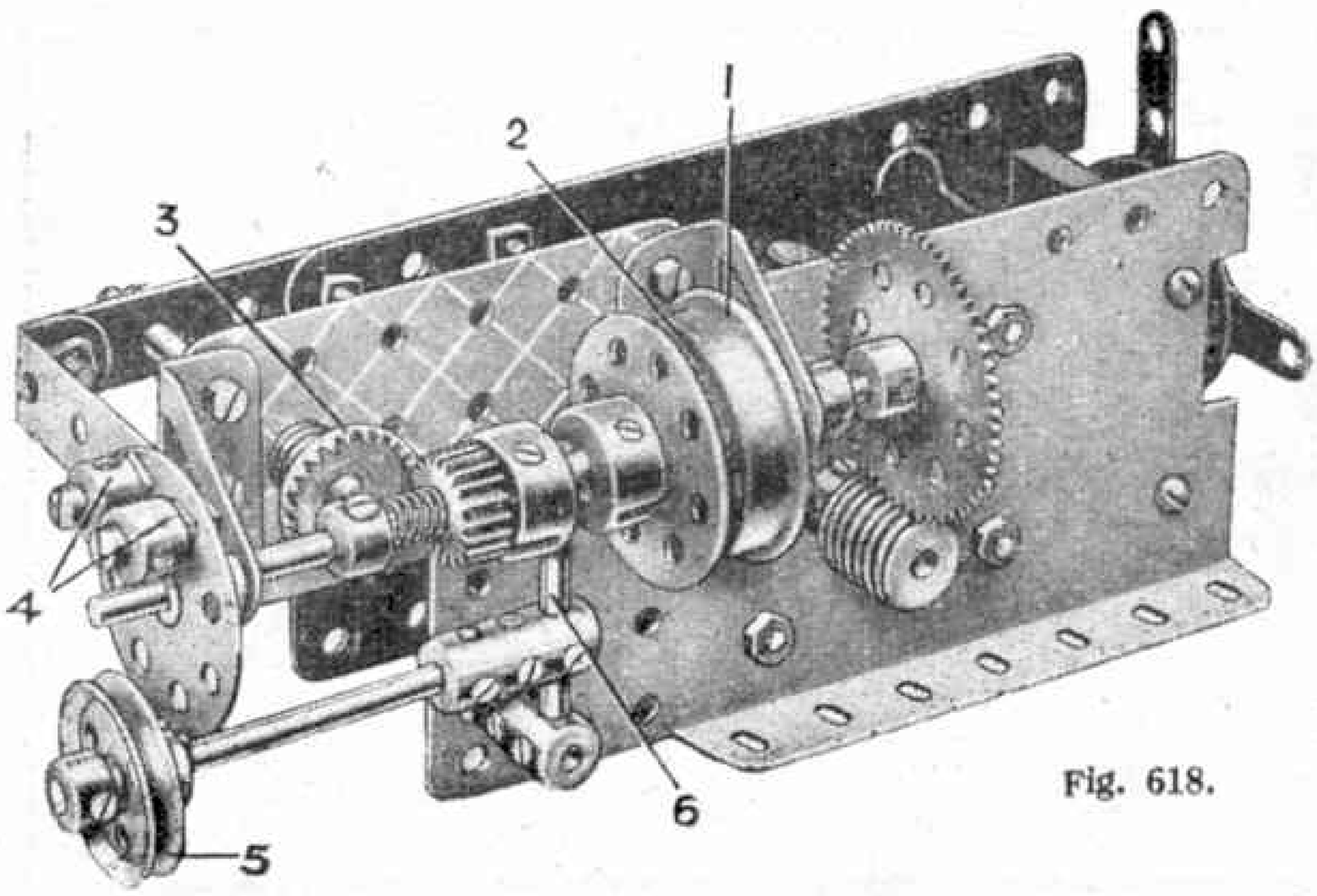


Fig. 618.

angle girder. A Collar placed on the inner end of each Rod bears against a Pendulum Connection 1, bent to the shape shown and secured to the beam by a 6 BA Bolt and Nut.

(618) Automatic Declutching Movement

("Spanner")

Many occasions for the use of an intermittent rotary motion are to be found in Meccano model-building. In the mechanism shown in Fig. 618 the motion is started and stopped by the automatic engagement and disengagement of a clutch, and there is little possibility of the time interval varying, for the stop that checks the movement is controlled by the motion itself.

The entire mechanism and the driving Motor may be built as a unit, thus simplifying its incorporation in a model. The drive is conveyed by a Worm to the 57-teeth Gear on a 5" Rod journalled in two Trunnions. The Trunnions are spaced from the 3" × 1½" Plate by Washers to allow clearance for the 57-teeth Gear. A 1⅛"-diameter Flanged Wheel 1 is fixed on the Rod, at the other end of which is a Bush Wheel. A Socket Coupling is fitted with a ½" Pinion and a Bush Wheel, which should be carefully trued up so that the unit rotates freely on the Rod. A 1" loose Pulley carrying the Rubber Ring 2 is placed between the Bush Wheel and the Flanged Wheel 1, and a Compression Spring at the other end of the sliding unit normally holds the Wheels in close contact with the Ring so that the drive is transmitted through the ½" Pinion to the ¾" Contrate Wheel 3.

The Bush Wheel on the end of the 5" Rod carries two Collars 4 that are free to rotate on ½" Bolts. As the Bush Wheel rotates, the Collars force the 1" loose Pulley 5 downwards. The Pulley is free to turn on a 2½" Rod held in a Coupling fitted on a 1½" Rod 6, which is also carried in a Coupling so that it is pivotally attached to the Motor side-plate.

The upper end of the Rod 6 engages the selector groove of the Socket Coupling, and downward movement of the Pulley 5 causes the Rod to force the Bush Wheel out of engagement with the Rubber Ring 2, thus bringing the driven shaft to a standstill until the clutch is re-engaged.

(619) Combined Wheel Driving and Steering Gear

(M. Jones, Cardiff)

The type of steering unit illustrated in Fig. 619 is designed for use in models where it is necessary to steer the driving wheels of a vehicle and at the same time provide great manœuvring ability. The steering wheel actuates a Worm 1, which in turn rotates a 57-teeth Gear 2. The framework supporting the road wheels is carried on this Gear, and the Rod forming the pivot transmits the drive to the Wheels from the power unit in the lorry, through the Pinion 3.

Steering units of this type, which is known as castor steering, are particularly useful in model mobile cranes, delivery vans and other special vehicles.

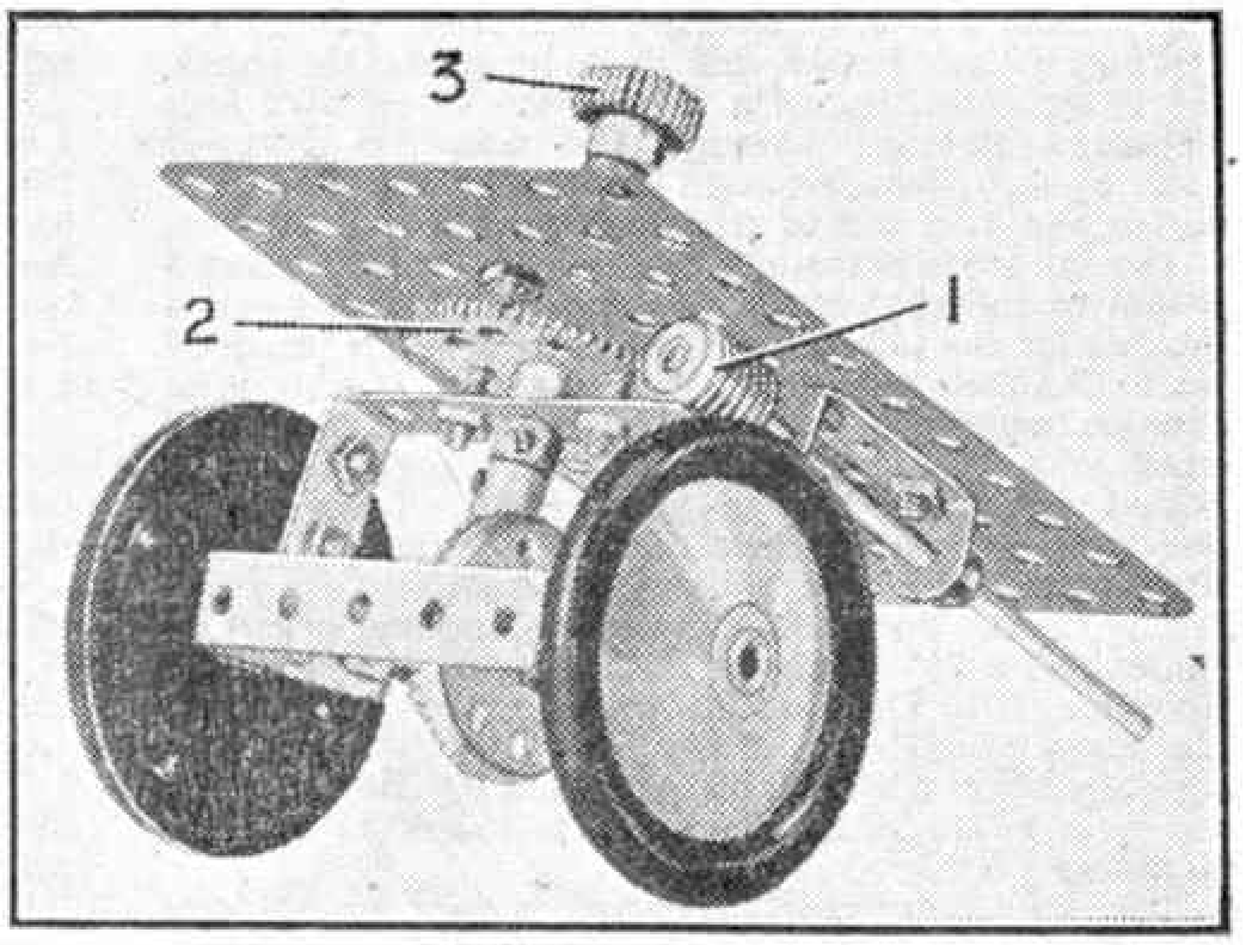


Fig. 619.

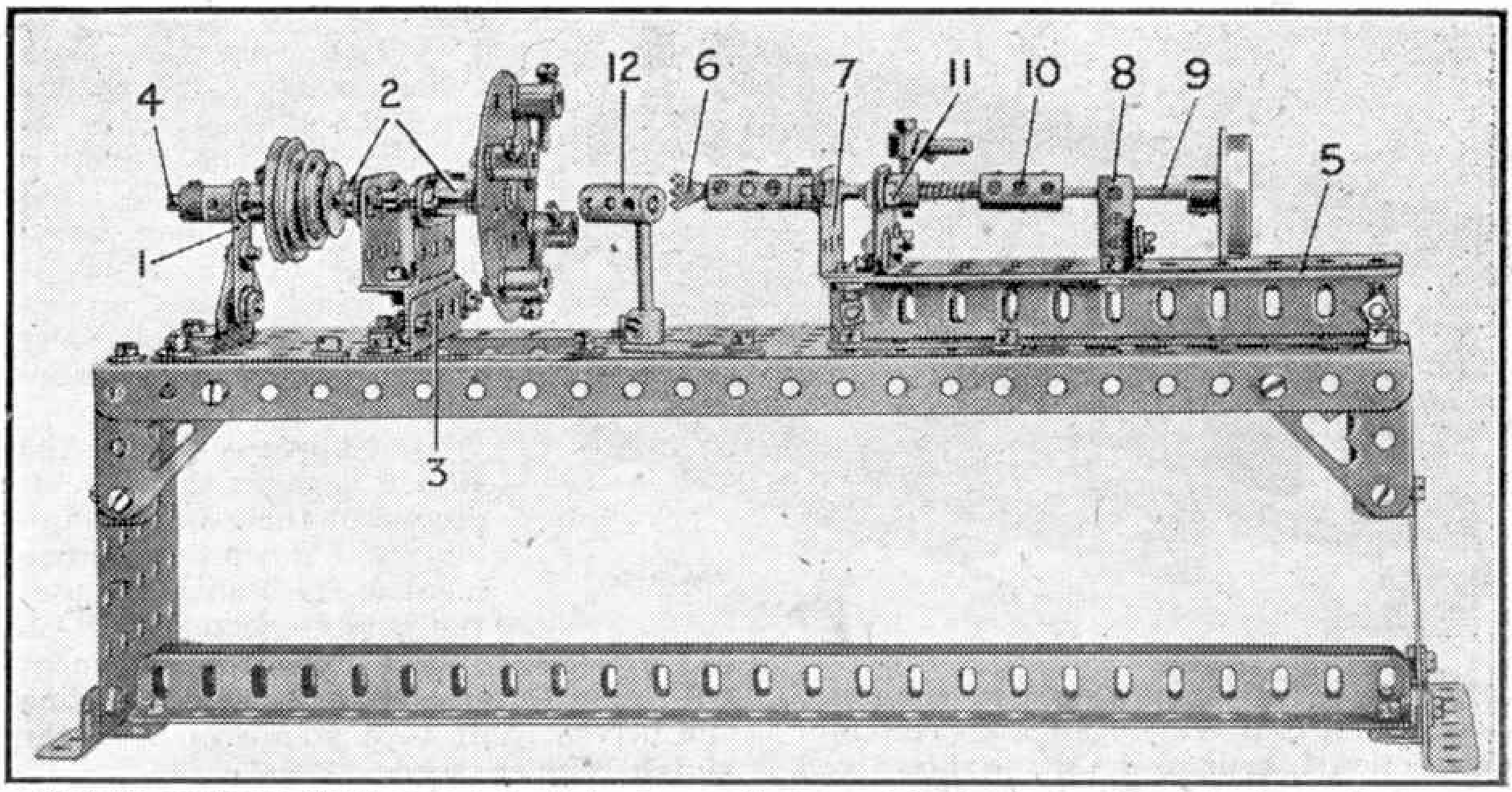


Fig. 1. A sturdily built Meccano lathe that can actually be used for turning small articles in wood or wax.

New Meccano Models

A Fine Working Lathe and Knife Grinder

SEVERAL keen model-builders have written to us recently requesting details and illustrations of a simple lathe that they could build from their Outfits, and which would be sufficiently rigid in construction to make it suitable for turning small articles from wood. This month therefore we have decided to make a lathe of this kind the subject of our first new model, and this is illustrated above.

The constructional details of the lathe bed and supports will be clear from the illustration, and therefore do not require description. The headstock bearings are built up as follows. The outer bearing consists of a Crank 1 bolted to a Trunnion that is fixed to the 12½" Angle Girders forming the lathe bed by means of ½" Bolts, but is spaced from them by means of four 1½" Strips. The inner headstock bearing consists of Double Arm Cranks 2 bolted to a Channel Bearing, the latter in turn being supported on two 2" Angle Girders 3 bolted together as shown. The spindle 4 is a 4" Rod, which carries between the bearings a Cone Pulley, and at its inner end the chuck, the latter consisting of a Face Plate fitted with four Threaded Bosses. Through the transverse tapped holes of each Boss is passed a ¾" Bolt. The Bolts can be screwed in or out to grip work of various diameters.

The tail stock is mounted on two 5½" Angle Girders 5 bolted to the 12½" Angle Girders. At the inner end a bearing for the tail centre 6, a Centre Fork, is provided by a Channel Bearing 7, carrying two Double Arm Cranks, while the rear end bearing is a Coupling 8 fixed to a 2" Angle Girder. The 2" Angle Girder is bolted across the 5½" Angle Girders. Through the end tapped hole of the Coupling a Screwed Rod 9 fitted with a Flanged Wheel is passed.

The Centre Fork 6 is fixed in a Coupling locked on the end of a 2½" Rod, this Rod carrying also a second Coupling 10. The end of the Screwed Rod enters the longitudinal bore of Coupling 10 as shown, and a Compression Spring is placed on the 2½" Rod between the boss of the outer Double Arm Crank 11 and the Coupling 10.

The tail centre can be moved inward or outward from the Face Plate by rotating the Flanged Wheel. A locking device is provided to fix the tail centre in the required position, and this consists of a ½" Bolt fitted with a Collar carrying a Threaded Pin.

The tool rest 12 is a Coupling fixed on one end of a short Rod held in a Crank, which may be bolted at any suitable point along the bed of the lathe.

This fine model is sufficiently rigid in design and construction to allow it to be used for forming small articles in wood or wax. It can be driven either from a treadle or from an electric motor of the "Klaxon" high voltage type. This motor gives two driving speeds, and as the lower one of these runs at 100 r.p.m., the pulley of the Motor can be coupled direct to the Cone Pulley of the lathe.

A suitable cutting tool can be formed from a small piece of steel such as a file, but if facilities are not available for fashioning a special tool in this way, a penknife or a chisel can be used for the purpose.

To ensure successful running of the model it is essential to see that all the bearings are in exact alignment and that they are properly lubricated with a thin oil.

Parts required to build model Lathe: 4 of No. 6a; 4 of No. 8; 2 of No. 9; 2 of No. 9b; 2 of No. 9d; 1 of No. 15b; 1 of No. 17; 1 of No. 18b; 1 of No. 20; 63 of No. 37a; 63 of No. 37b; 32 of No. 38; 2 of No. 53; 2 of No. 59; 2 of No. 62; 4 of No. 62b; 4 of No. 63; 4 of No. 64; 1 of No. 65; 1 of No. 81; 1 of No. 109; 5 of No. 111; 1 of No. 115; 1 of No. 120b; 1 of No. 123; 1 of No. 126; 2 of No. 133; 2 of No. 160.

A knife grinder working his portable grinding machine forms the subject of our second model this month. Only a few years ago these machines were common sights in our streets, and although they are less often seen nowadays, most of our readers will be familiar with them. The model shown in Fig. 2 is an excellent reproduction of this construction, and when set in motion by means of a *Magic* Motor operates most realistically.

The model is built up on a base consisting of a 5½" × 2½" Flanged Plate. From each corner of this four 3½" Strips support two 5½" Angle Girders. The latter are bridged by means of a 2½" × 1" Double Angle Strip 1, which serves to make the structure rigid. A 3½" Rod journalled in the rear two 3½" Strips

carries the Flywheel and a Crank 2. The Flywheel is rotated through the Crank by means of a treadle 3 consisting of a 5½" Strip, which is pivoted on a Rod journalled in a 2½"×½" Double Angle Strip bolted to the base. At its rear end the 5½" Strip is pivotally attached by means of a lock-nutted Bolt 4 to the lower end of a 2½" Strip. The other end of this Strip is pivotally attached to the Crank as shown, also by means of a lock-nutted Bolt 5. The grinding wheel is represented by two 1½" dia. Flanged Wheels 6, placed face to face on a 3" Rod journalled in the 5½" Angle Girders. A Driving Band connects the Flywheel to the Flanged Wheels.

The constructional details of the figure of the man are quite simple. He carries in his hand a short Rod 7 representing a knife, which he is in the act of sharpening on the wheel, and is pivoted on a Rod 8 passed through the end holes in the 5½" Angle Girders. His body consists of two 1½" Strips spaced apart by Double Brackets, and his right arm is built up from a Flat Bracket and a 1½" Strip. The left arm is a 2" Strip. The neck is a 1"×½" Angle Bracket, which carries a 1" loose Pulley forming his head. The left leg is a 2" Strip extended by a Flat Bracket placed at a suitable angle to represent a foot, and the right leg is also a 2" Strip, but is fitted with an Angle Bracket. The Angle Bracket is bolted to a Flat Bracket, which in turn is bolted to a Reversed Angle Bracket fixed to the treadle by the Bolt 9.

Parts required to build model Knife Grinder and Machine: 4 of No. 3; 1 of No. 5; 5 of No. 6; 3 of No. 6a; 2 of No. 9; 3 of No. 10; 2 of No. 11; 1 of No. 12; 1 of No. 12b; 1 of No. 16a; 3 of No. 16b; 2 of No. 20; 1 of No. 22a; 34 of No. 37a; 28 of No. 39b; 1 of No. 46; 1 of No. 52, 4 of No. 59; 1 of No. 62; 1 of No. 132; 1 of No. 154a; 1 of No. 186.

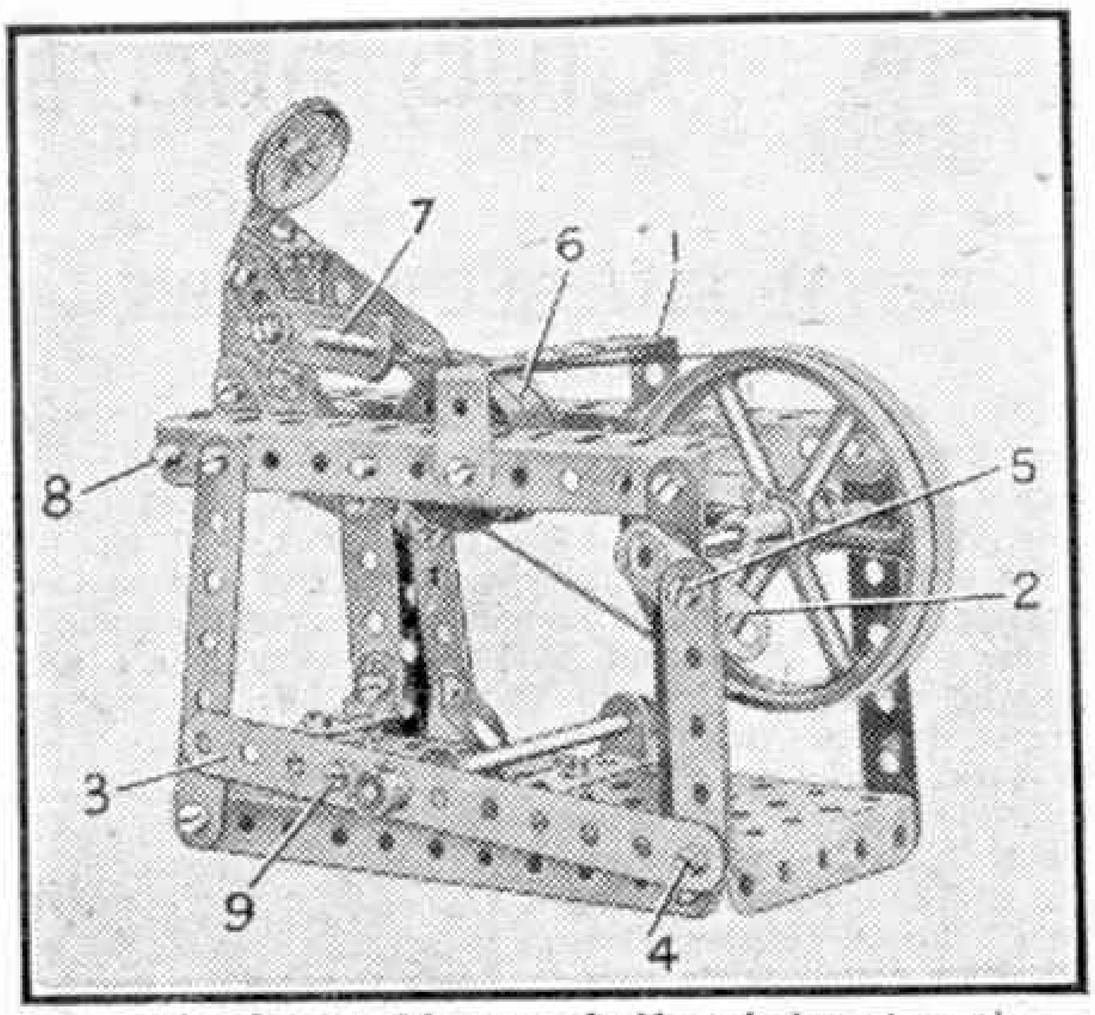


Fig. 2. The Meccano knife grinder at work.

Meccano Model-Building Contests

By "Spanner"

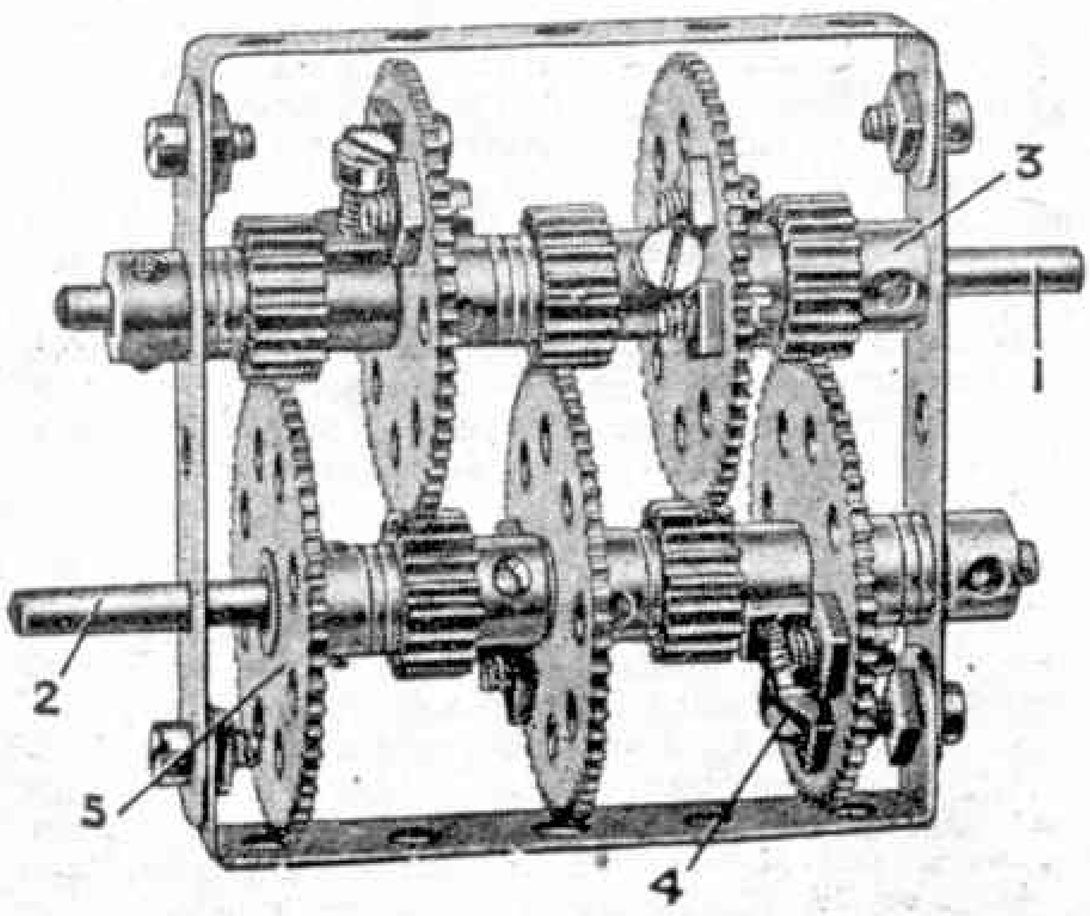
A Gear-Box Contest

The construction of gear mechanisms is one of the most interesting and attractive branches of model-building, and to encourage readers to try their skill in devising new and efficient forms of gear-boxes we are organising a special competition in which fine prizes will be awarded for the best specimens submitted to us.

All that a reader has to do in order to compete for these prizes is to build a gear-change mechanism of some kind. For example, this may be some form of 3- or 4-speed gear-box complete with a reverse drive, such as that seen in the illustration at the foot of this column, and gear-boxes giving only either step-up or reduction ratios also are eligible.

The competition is open to readers of all ages and will remain open for entries until 30th November. The prizes to be awarded are as follows. First, Cheque for £2/2/–. Second, Cheque, for £1/1/–. Third, P.O. for 10/6. There will be also five consolation awards, each consisting of a Postal Order for 5/–. There will be a special section for Overseas readers, with prizes of equal value, and in this the closing date will be 31st May, 1944.

After completing his model a competitor should either obtain sharp and clear photographs of it or, if this is not possible, prepare clear drawings showing all the principal features. He should write his age, name and address on the back of each sheet of his entry, and this should then be sent to *"Gear-Box Competition, Meccano Ltd., Binns Road, Liverpool 13."*



For Readers under 10 Years of Age

Here is a novel competition for the youngest readers of the "*M.M.*," planned specially for their benefit. In it entries will be accepted only from those under 10 years of age, and any kind of small model whatever is eligible. The only restrictions are that not more than 20 nuts and 20 bolts may be used, *no* Gear Wheels, Worms or Pinions must be included, and none of the special Meccano Parts, such as Ball Races, Digger Buckets or Ship's Funnels must be used. Strips, Angle Girders and Rods, and pieces such as Angle Brackets and Double Angle Strips should form the main components of the model, and if desired any of the various Pulley Wheels may be incorporated.

A competitor should send a neat drawing of his model to "*Junior Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13*" and must post this in time to reach this office before 30th November. He should remember to write his age, name and address on the back of his entry before posting it.

The sender of the best model received, provided that the model satisfies the conditions mentioned above, will be awarded a Cheque for £2/2/–, and there will be a Cheque for £1/1/– and a Postal Order for 10/6 for the senders of the two models considered to be the next best respectively in order of merit. There will be a section for which only readers living Overseas will be eligible, and in this the closing date will be 31st May, 1944.

Club and Branch News

WITH THE SECRETARY

A NEW START

Now we come to the beginning of the Winter Sessions of 1943–44, and we start these with bright hopes in Clubs new and old. The past years have brought with them many disturbances, but in all cases the spirit has been kept alive, and now is the time for revival and the beginning of a great advance. I am glad to find that enthusiasts everywhere are making efforts to join in the movement. A list of some of those who wish to form Clubs in various districts is given elsewhere on this page, and all Guild members living near should immediately get into touch with them and give them all the support they can. This applies also to Branches. Branch work in these days has its difficulties, just as Club work has, but these can be overcome, or at any rate side-tracked until the time comes when schemes of all kinds can be planned and worked out in full.

The first thing necessary in all the Clubs is an inflow of new members. Recruiting schemes therefore should be carefully considered now. The best of all methods is personal canvassing by members, and this is particularly valuable in times like these. Every Club or Branch member should do his best to get his friends to join in the movement, not by just talking to them, but by inviting them to try it for themselves. Once boys have sampled meetings, and have seen what fun can be had at them, they are sure to wish to share in the general friendliness and to become full members.

PROPOSED CLUBS

BEXLEY HEATH—Mr. W. Taylor, 46, Upton Road, Bexley Heath, Kent.

LONG ITCHINGTON—Master H. Windsor, The Shop, Long Itchington.

LEEK—Mr. P. G. England, 18, Burton Street, Leek, Staffs.

OKEHAMPTON—Mr. P. Atherton, 4, Neville Road, Okehampton, Devon.

PROPOSED BRANCHES

GLASGOW—Mr. A. McLachlan, 15, School Lane, High Blantyre, Glasgow.

HUDDERSFIELD—Mr. D. Graham, 19, Moorside Avenue, Crosland Moor, Huddersfield.

OXTED—Mr. A. Wood, 2, Roseleigh, Holland, Oxted, Surrey.

SHEFFIELD—Mr. H. Hughes, 14, Furnace Lane, Woodhouse Hill, Sheffield 9.

THREE BRIDGES—Mr. C. J. Baldwin, 27, St. Mary's Drive, Three Bridges, Sussex.

CLUB NOTES

NAVENBY M.C.—The Club's Garden Fête and Exhibition was very successful. The former was remarkable for the fine efforts of members in the sports events. The chief feature of the Exhibition was a display of models by members, and the side-shows included a shooting gallery, in which a small charge was made for shots with a Meccano Machine Gun that fired spring clips, and a bagatelle board. Club roll: 18. *Secretary:* P. I. Addison, High Street, Navenby, Nr. Lincoln.

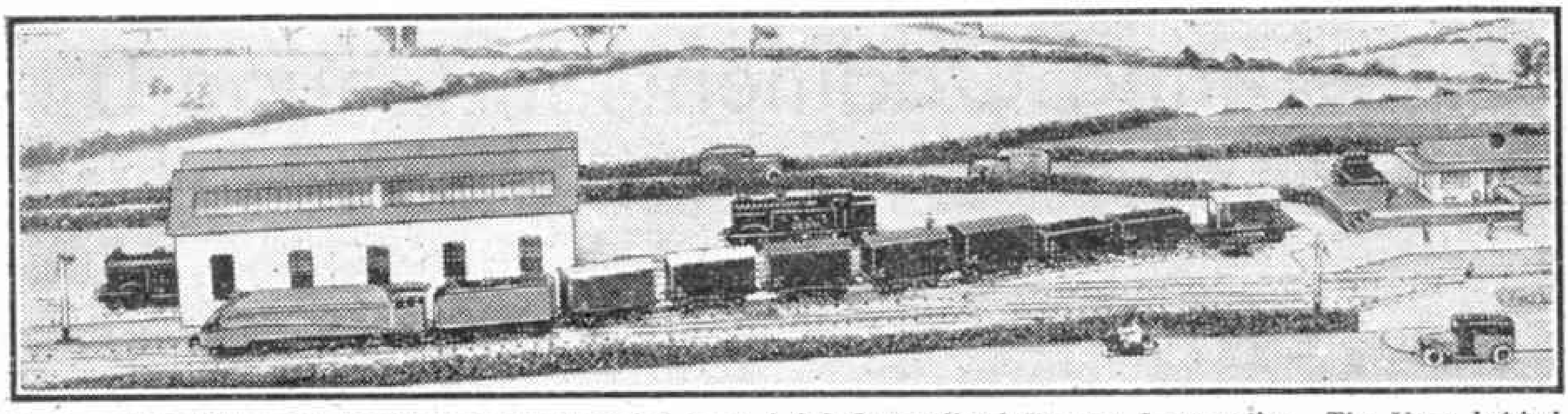
Members of the Plymouth M.C. photographed during a ramble. Mr. W. J. Ellis, Leader, and Mr. E. Emdon, Assistant Leader, are seen in the back row, third and second from the right respectively. The Club's membership is nearly 100, and meetings are held four times weekly for Model-building, Hornby Train operation, printing and other hobbies, and an Electrical Section has now been formed.

EXETER M.C.—Good work has recently been done in Model-building. One of the models constructed has been the secretary's idea of a space machine, and another is a revolving photograph display stand, to contain photographs of outstanding models constructed by Club members. The Club continues to make a good show in the Exeter Parliament of Youth, and the approach of the football season has given rise to the usual intense activity. Club roll: 150. *Secretary:* J. Cory, 24, Clifton Hall, Exeter.

HORNSEA M.C.—During the summer outdoor games such as Cricket and Bowls have been played, and the Club's Hornby Railway has been kept in operation. Good models have been constructed in the Woodwork Section, and simple analysis has been carried out by members of the Science Section. Meccano Model-building also has been carried on continuously with success. Club roll: 30. *Secretary:* C. Kemp, 5, Carlton Terrace, Hornsea.

BRANCH NEWS

WATERLOO (DUBLIN)—Hop-picking traffic began at the end of August, and all passenger rolling stock was thoroughly overhauled in readiness for this. Special trains for hop-pickers are appropriate to the Branch layout, which represents in miniature the Kent and East Sussex Railway. The track is steadily being improved and is kept in fine condition. *Secretary:* S. B. Carse, 38, Oakley Road, Ranelagh, Dublin.



A general freight train leaving the yard hauled by a 4-6-2 Streamlined Express Locomotive. The Vans behind the tender are supposedly "brake fitted," as explained on this page.

Rolling Stock on Dublo Layouts

IN miniature railway working we must see that we have the right vehicles on the spot at the right time for any services that we may require to run, as is done through the Control Office on a real railway. Our working arrangements should therefore be planned so that as far as possible we do not have a great number of empty trains or have to pick up odd vehicles here and there before we can commence operations. Special trains that have to be run at short notice, as so often happens in these times, may make an "empty trip" working necessary; in general, however, we should endeavour to finish up our cycle of operations so that everything is ready in position for the next "episode." This is not difficult as a rule on simple layouts.

The correct use of the different types of wagons or vans is rather a problem for the average Dublo owner to-day with no new material available. He must therefore make the best use of what he has, and in addition attend to the various details of maintenance so that there are no "crippled wagons" lying by. Attention to cleaning wheels, oiling axles and adjusting couplings will ensure good running, avoid delays, and help to prolong the life of the stock.

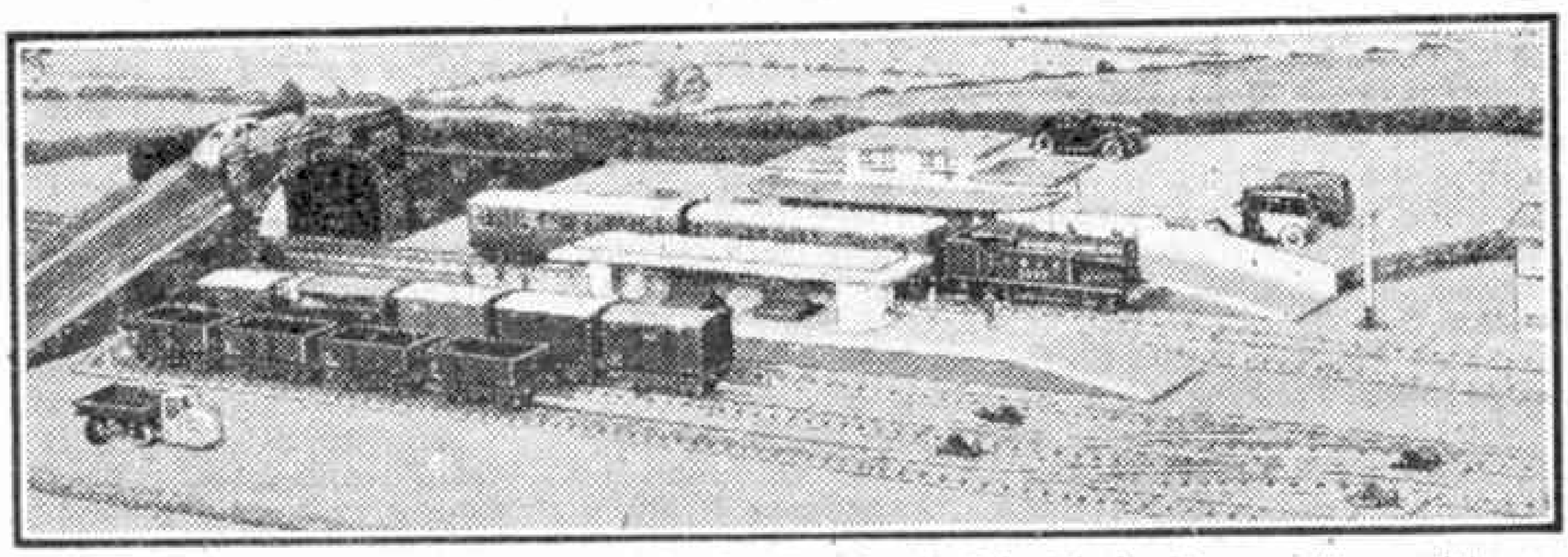
The uses of different types of Dublo Wagons and Vans are for the most part suggested by their names. Some of course are more of a "special purpose" character than others; Horseboxes and Tank Wagons, for example. Others again are adaptable for several purposes, apart from such general merchandise vehicles as the Open Wagons. If we have on our layout perhaps one only of several different types of wagons we must be content with running trains of a general or mixed character. Not all such trains are merely local "pick-up goods" in real practice; some convey a general load through from starting point to destination. So we can have some good main line running with such a train in miniature and even use our Streamlined 4-6-2 Express Locomotive to haul it.

A point to note in connection with a train of this kind is that it is usual in real practice to assemble behind the engine as many as possible of the vehicles that are fitted with automatic brakes for express working. They are thus able to supplement the braking power of the engine when connected up; this is of great assistance to the driver if the train is a long one and the road lies over numerous ups and downs. In miniature we may take it that all our Vans are brake fitted, including of course the Horsebox and the Cattle Truck. Some open wagons are similarly fitted, but not as a rule those dealing with coal or mineral traffic unless they are of the high-capacity type. Thus an Open Wagon, supposedly "brake-fitted," or the Dublo Brick Wagon could be run among the fitted stock behind our engine, but not a Coal Wagon.

If we are short of stock in making up a coal train we can always press the Brick Wagon into use to help matters. Similarly the standard Vans can always be assumed to be suitable for perishable traffic working. Thus we can change the character of our freight trains by the aid of a little "pretending." Where we have only one Cattle Truck or Horsebox we can occasionally work a little "special" consisting of these vehicles only; and if they require fast transit and we do not happen to have a "general" express freight on the programme at the time we can convey them by passenger trains.

Nowadays covered wagons and cattle trucks are often used for the carriage of oil in drums, so that if we want to run a petrol or oil special, and have only one Tank Wagon, we can use this with a few of the other vehicles just referred to. This will result in an unusual and interesting formation; in addition to special working this combination could form part of a general freight train. The oil carrying vehicles, if "loaded," should be marshalled if possible in the centre of the train, as this is the safest place for them.

Passenger trains on Dublo layouts invariably consist of the Two-Coach Articulated Unit, and perhaps a standard Corridor Coach for strengthening purposes. This assembly makes a respectable express train, and the Articulated "twin" can be used alone to make a handy unit for local passenger work. Articulated suburban trains are common on the L.N.E.R., so that the use of the Dublo Unit for this purpose is quite good practice. Real main line stock is often used for local working at the present time.



"All Stations to Dublo Junction"! A Hornby-Dublo Tank Locomotive with an Articulated Unit used for local passenger work.

Operating Oddments in Gauge 0

HORNBY railway owners are invariably keen to notice any special or unusual operations in real railway practice and to endeavour to reproduce these in miniature on their own systems. Present-day conditions constantly give rise to workings of unusual interest and the article for the most part deals with a few schemes of this kind as carried out on a Hornby system.

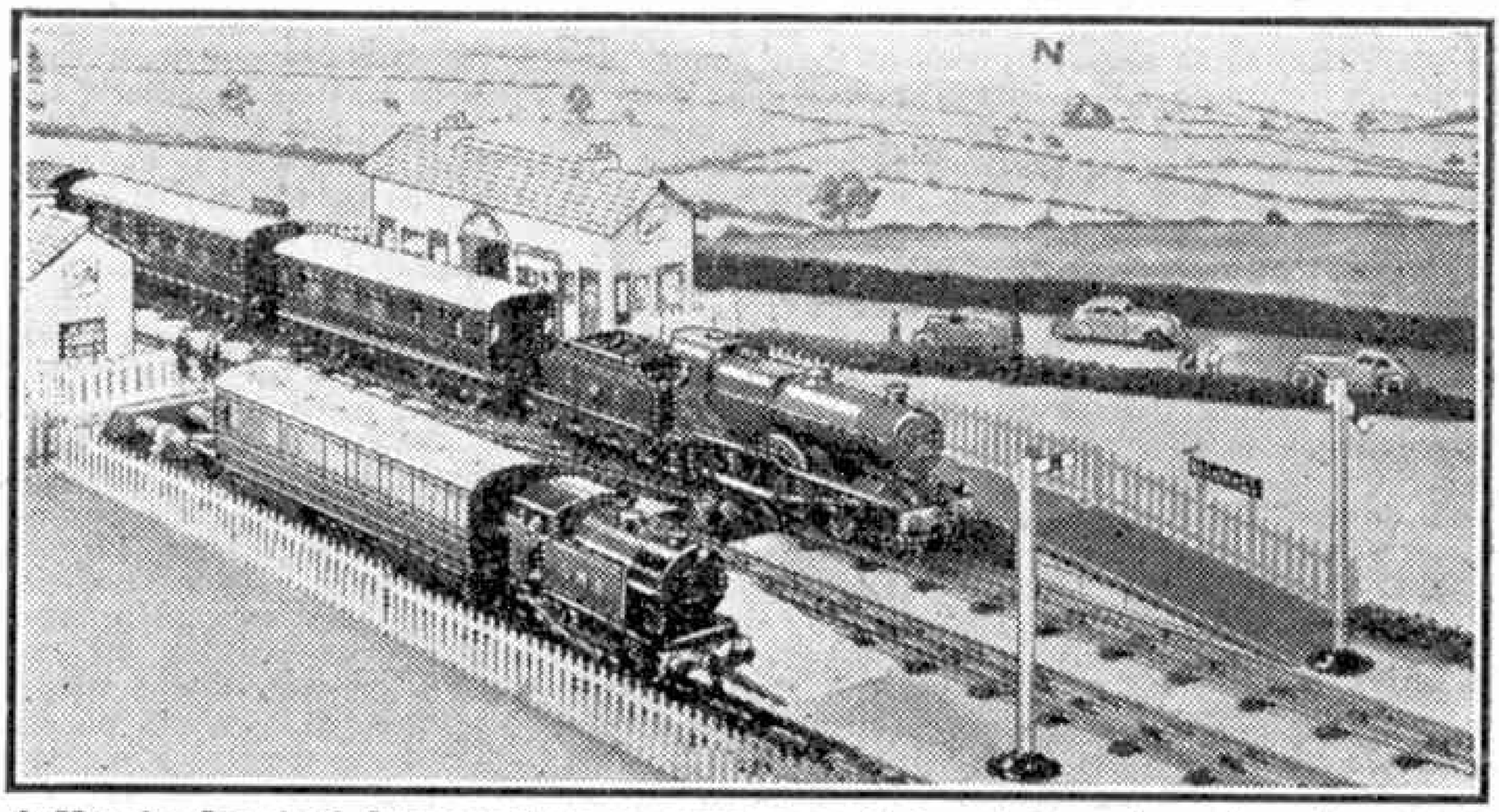
Some model railwaymen have a leaning to joint or combined working with the engines and stock of several companies together. This state of things is often found on H.R.C. Branch layouts, or when several boys combine their equipment to form a single system. Normally the cause or rather explanation is found in some imaginary joint system or through working arrangements. Nowadays, however, the exchange and loan of engines and stock between the different big systems makes possible the most extraordinary combinations. Owners of L.N.E.R. layouts can, for instance, run their fast goods trains perfectly correctly with say S.R. locomotives normally attached to their friend's system. Or a local goods on a G.W.R. line can be run with an L.N.E.R. engine and so on.

A development of special interest to owners of the splendid Hornby S.R. "*Eton*" Locomotive has been the recent use of an engine of this class on the West of England main line to Exeter. This is a new venture for the "Schools" class that S.R. enthusiasts will hasten to follow up in miniature. A point that will appeal to those who do not live on the route in question and who are unable to make their own observations concerns the head code, or "engine head signals" to use the official term, that is displayed by engines on these turns. This consists of the usual white discs in daytime, one carried on the top lamp bracket and the other centrally above the buffer plank. Lamps in these positions are used at night. With the usual miniature railway licence we can use our "*Eton*" models on fast freight trains also; the head code in such cases is the same as for passenger trains. Route indication, not train classification, is the object of S.R. engine head signals.

In this way we can arrange a variety of workings for our "Schools" engines. Passenger services for various destinations, each indicated on the destination boards carried on the roof brackets of Hornby No. 2 Corridor Coaches, can be dealt with in one direction while Milk Tank specials or trains of "perishable" stock can be arranged as "balancing" turns of duty on layouts representing the route to the land of Westward Ho! While these arrangements apply particularly to the "*Eton*" model they can also be applied as typical duties for other S.R. Locomotives of the Hornby Series.

As recorded in the "*Railway News*" pages of the "*M.M.*" some time ago the Standard Compounds of the L.M.S. have reappeared on the Euston and Birmingham express services from which they had been displaced to a great extent by larger locomotives. Owners of the popular Hornby No. 2 Special L.M.S. which represents this class of engine will no doubt be glad of the opportunity of arranging express passenger workings in miniature that will to some extent reproduce those of actual practice. Loads can be restricted to a certain number of vehicles, as they are actually on the L.M.S. In fact with this essentially "Midland" engine in use the application of various details of the control system typical of L.M.S. practice as suggested in the August Hornby Railway article will be an obvious scheme. Fairly fast, but not lengthy, start-to-stop runs with relatively light trains and frequent and regular trips make an ideal operating scheme for miniature practice, and this is all the more enjoyable because it is based on actual operating methods. Either clockwork or electric systems can be worked in this way.

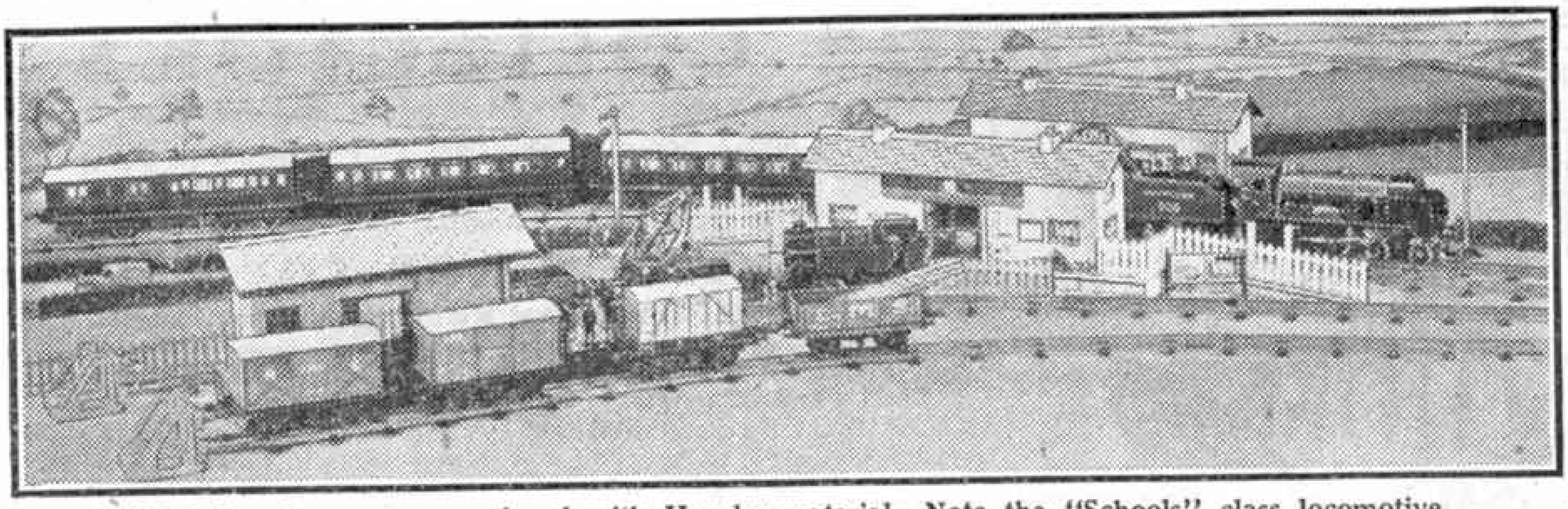
On any layout where the owner is so fortunate as to have both a "Standard Compound" model and a No. 3 "Royal Scot" Locomotive it will be quite in order under present conditions to keep the latter almost exclusively on freight work, especially if there are numerous "fast goods" workings. The No. 3 engine is representative of the larger types of "ten-wheelers" in use to-day and with its larger boiler and the smoke-deflectors at the sides of the smoke-box it looks very impressive at the head of a heavy train, either goods or passenger. While we are speaking of goods working we may recall that freight operations can be carried out just as methodically and regularly as passenger operations and "control" supervision can be extended to them also. Load limits for each class of engine can be laid down, although pressure of supposed "special traffic" may cause the limits to be exceeded at times. Similarly the running of specially urgent traffic at times may cause some goods trains to be made up to less than the normal booked load. A special of a few vehicles only, hauled perhaps by quite a big engine, is a common sight nowadays.



A Hornby Standard Compound on an express passing a station where there is a "pull and push" train in the bay platform.

An interesting detail in connection with special train working is a board on which appear certain figures, often displayed on the front of the locomotive. The figures form the "reporting number" allotted to the train by the control staff so that it can readily be identified while on its journey by signalmen and others. On the L.M.S. the number is prefixed by a letter indicating the Section on which the train is running, or at least on which it originated, such as "W" for Western Division, "M" for Midland, "C" for Central and so on.

The boards are black, and the numbers are printed



A West Country scene reproduced with Hornby material. Note the "Schools" class locomotive.

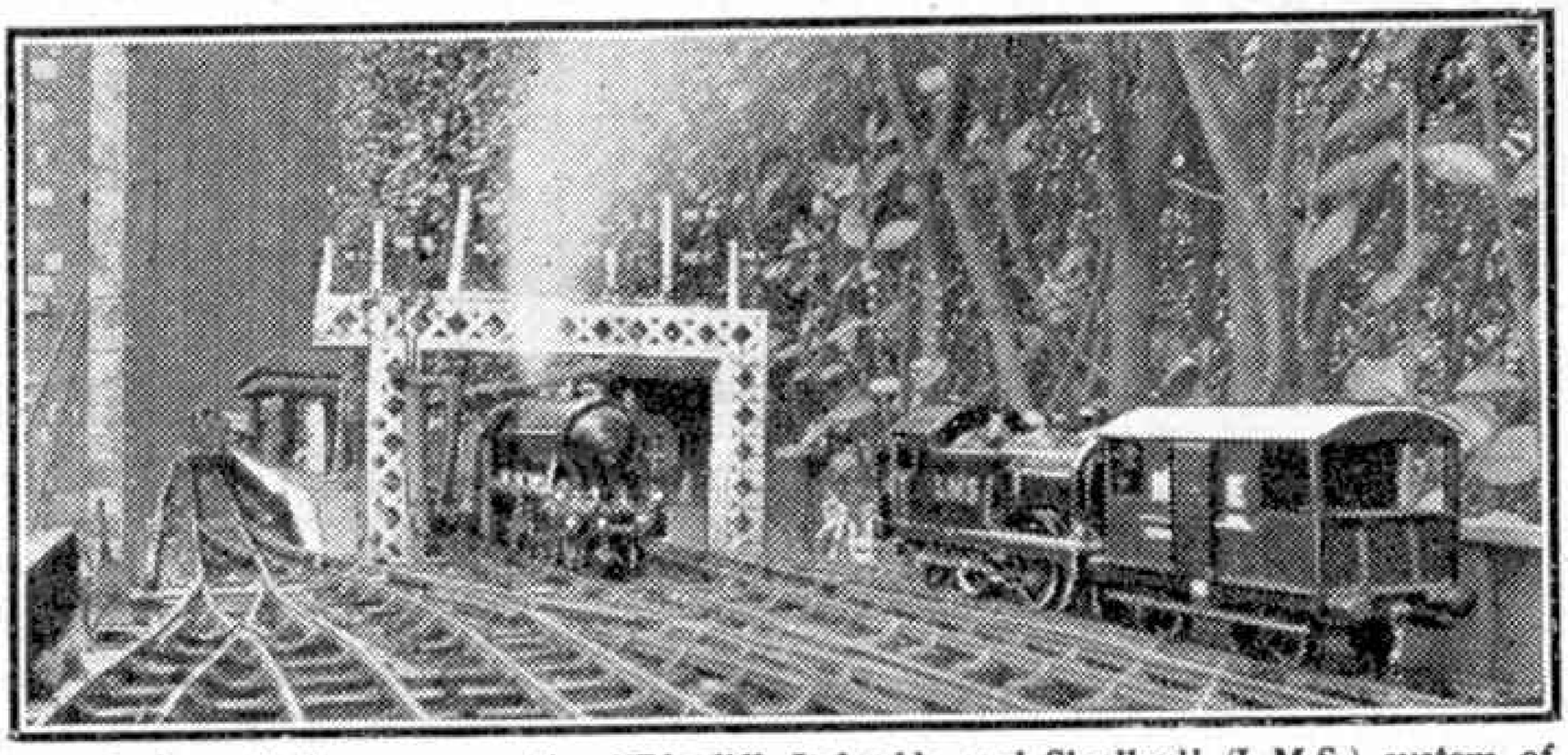
in black on white paper pasted to the boards, each figure or letter being done separately. Thus in miniature we could cut out little squares or rectangles bearing the required numbers from an old book. say, and gum them on to a piece of thin card painted black to represent the board. This should be about three quarters of an inch long by three eighths wide, but strict adherence to these sizes is hardly necessary. Near the top edge two small holes can be pierced with a pin and a small piece of cotton threaded through them so that the "board" can be hung from the top lamp bracket.

This little item will add considerably to the fun and realism of operating, especially if the figures shown are taken from an actual train that we have seen, or, alternatively, if they indicate the actual operating number or sequence of the train in our own working arrangements.

Part of an outdoor system on which special attention is given to traffic working is shown in the lower illustration on this page. This is the "*Bincliff, Lakeside and Shedley*" line, an L.M.S. layout that is owned and operated by Mr. C. B. Smith, Lincoln. The "place names" included in the title of the railway are suggestive of the situation of the line; for instance "*Bincliff*" is situated near to the domestic bin, and "*Shedley*," the principal station, is located in a shed where ample protection is afforded for the points and crossings and the station buildings and accessories generally. The train shown in the illustration is a heavy passenger formation with a big 4–6–0 at the head. This is a steam driven model the design of which is based on the general lines of the L.M.S. "Royal Scots." The engine also takes turns in freight working, a special feature being made of perishable traffic operation; both in vans and containers. For general goods working there is also a model Standard Freight 0–6–0 of the L.M.S. "Class 4"; passenger traffic is shared by a Hornby Standard Compound and local trains are dealt with by 4–4–0 and 0–6–2 tanks. There is in addition a diminutive 0–6–0T for light duties such as motor train working; this has as the basis of its motive power a clockwork mechanism of the Hornby M1/2 locomotive.

Motor train or pull and push working is something of a novelty in model practice but a typical train of this kind assembled from Hornby components is shown in the bay platform of the station in the illustration on the previous page. These are respectively an M3 Tank Locomotive and a Brake Composite No. 2 Passenger Coach. The latter vehicle provides passenger, luggage and guard's accommodation, and we can also imagine that it includes the necessary driver's compartment at the end that is occupied when the engine is pushing the coach. If we reserve this vehicle specially for this service we can increase its realism by painting across the "luggage" end the two or three wide windows to afford a good view for the driver. Silver paint lined out in Indian ink and shaded with the same material if required will give quite a good representation of windows that will match in effect the windows that are a feature of the tinprint design of these vehicles. These printed windows in fact will form quite a good guide for the design and finishing of the new end windows that we are providing.

As we have explained in previous "*M.M.'s*" on several occasions the engine of a motor train pulls the train in one direction, but pushes it in the other. In the latter operation the driver rides in a special compartment at what becomes the leading end of the train and arrangements are made for him to control the working of the engine and the braking. The fireman remains on the footplate. Space is saved, as there is no "running round" to be done at terminal points, and a loop line and crossover points are unnecessary. This is a great convenience in miniature, which together with the unusual character of the running with the engine pushing, should commend such working to those readers who have not yet introduced it on their own systems. Sometimes special trailers cars are used as on the G.W.R.; to represent these a Hornby Pullman Coach is quite suitable. Alternatively a No. 2 Corridor Coach in G.W.R. colours, if available, could be employed, its wide windows making it similar to the special trailers often found on the G.W.R. For a two-coach train one vehicle of each kind could be used with quite realistic results.



Steam! A realistic scene on the "Bincliff, Lakeside and Shedley" (L.M.S.) system of Mr. C. B. Smith, Lincoln.

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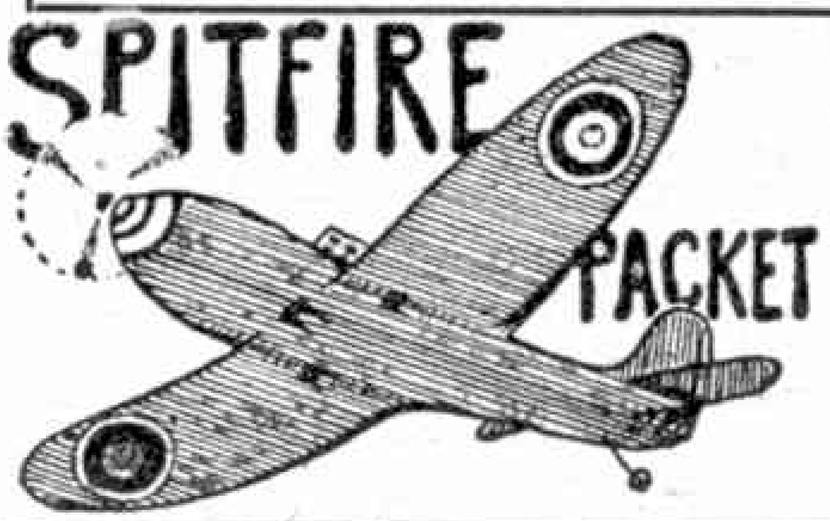

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For other Stamp Advertisements see pages 356 and v.

Stamp Collecting

Why Not British Commemorative Stamps?

By F. E. Metcalfe

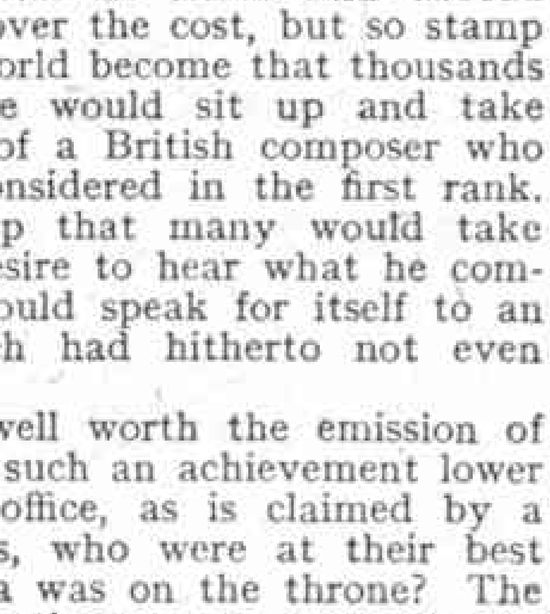
IN last month's "*M.M.*" the question of special postage stamps was discussed. As was mentioned then, the article was inspired by a radio talk that had been given about the great English composer William Byrd. On one of those happy days when we were on speaking terms with Italy, an Italian remarked to the writer that it was a national scandal that the British public did not know the compositions of William Byrd as well as it *thought* it knew the works of William Shakespeare.

We are inclined to think that the world in general has never given us much credit for our composers. Now if this is the case they have apparently taken their cue from ourselves, for our own neglect has been almost complete, speaking generally. However, suppose for a change we decide to give some credit where credit is due and instead of lavishing *all* our homage on footballers, give some also to people who matter.

This year is the 400th anniversary of the birth of William Byrd, and if the authorities issued a special postage stamp in honour of that great event, not only would stamp collectors at home and abroad buy enough of them to cover the cost, but so stamp conscious has the whole world become that thousands upon thousands of people would sit up and take notice for the first time of a British composer who has every claim to be considered in the first rank. The next very short step that many would take would be an expressed desire to hear what he composed. Then his music could speak for itself to an interested audience, which had hitherto not even known of his existence.

Wouldn't all that be well worth the emission of a postage stamp? Would such an achievement lower the dignity of the post office, as is claimed by a small coterie of collectors, who were at their best when good Queen Victoria was on the throne? The fact that she is no longer there seems somewhat to have escaped their notice.

Whilst the postal authorities were about it they might choose to honour one or two more of our composers, as did the U.S.A. That enterprising country paid homage by issuing stamps bearing portraits of Foster, Sousa, Herbert, MacDowell and Nevin. Need we be ashamed of Purcell, Byrd, Sullivan, Elgar, Delius and the like? The U.S.A. also honoured similarly 10 of its great writers. What is to prevent our doing the same, with names like Chaucer, Shakespeare, Milton, Dickens, Scott, Wordsworth, Chesterton, Burns, Byron, Stevenson, etc., to conjure with?



The U.S.A. has been referred to several times in this article, but only because it is the country that seems nearest to us in these momentous days, and not because it is the only country which is honouring its sons. As a matter of fact the rest of the civilized world is doing exactly the same thing, and is it fair to our own great men that they shall go on being denied similar recognition?

Of course special stamps are not only useful for honouring great people, and a glance at the catalogue shows that their incomparable publicity can be applied in thousands of ways.

One of man's greatest inventions was the railway engine, and when the centenaries came round of the opening of their first railways, countries like Germany, Holland, Italy, Austria, etc., gleefully issued special sets of stamps in commemoration. Yet all these countries were only "also rans." The very first country, with the very first railway train, was too much concerned about the dignity of its post office to do anything about it, and once more Great Britain missed a chance of a lifetime to show the world that it does not always "miss the bus."

Austria, besides "saying it with stamps" when its first railway centenary came round, has also honoured its doctors, painters—somehow Hitler was overlooked—inventors, etc., with some of the finest line-engraved stamps ever issued. Would that our own post office had fathered such wonderful stamps! We would somehow have put up with the indignity of its lowered prestige.

France, besides honouring many of her sons, and raising huge sums for charitable purposes, by means of special stamps, even issued a stamp when the "*Normandie*" wrested the "Blue Riband" of the Atlantic from Great Britain, and so placed on record for all the world to see just what fine ships she can build. Can anybody think how this fact could have been driven home in any other manner half as effectively? And at the same time a profit was actually made out of the transaction?

Russia is another of the many countries that have come to recognise the publicity value of postage stamps, and some of those issued during the past few years cannot help but have achieved their object so attractive have they been. Here we come to an important point. Unless special stamps *are* attractive their appeal suffers accordingly, and this has been the trouble with the few our own post office has put out. Last week we illustrated a fair selection. Could any have been more miserable? It is hard to believe that a country that could produce for others the stamps that are illustrated this month could have done such a poor job for itself. As already stated, it's all a question of the wrong people doing the right job and vice versa.

(*Cont. on page 357*)

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For other Stamp Advertisements see pages 354 and v.

Stamp Gossip
and Notes on New Issues

The most interesting release of the month, as the movie critics would say, is the new printing of all values of Grenada, except the 2½d. and 3d. denominations. When this set first appeared, all with the exception of the 10/– stamp were perf. 12½, but in subsequent printings this was changed to 12¾ × 13½ in the case of several values, and gradually some of the stamps in the original perforation became quite scarce, particularly the 1½d. Copies of this latter were recently selling at several shillings each, but alas for those who bought at this price, all values which have now been re-issued, except the top value, have reverted to perforation 12½ and so now one can buy the 1½d. for fewer coppers than it was costing shillings.

The handsome 10/– stamp has changed from 11¾ × 13¾ to 14, and readers can be very proud if they have the original stamp already in their collection, for few dealers can supply. They have not been able to get stamps from Grenada for many months, and probably very few of them have been able to put any away. Yes, collecting colonial stamps whilst they are current can sometime be profitable, as well as entertaining; at the same time collectors who only concern themselves with the monetary side of our hobby, and alas there are plenty of these, miss the real fun of collecting stamps.

A very typical set of stamps, one of which we are illustrating, has been issued by Sweden to commemorate the 85th birthday of King Gustav V. Three values are concerned, 20 ore, red; 30 ore, blue; 60 ore, violet. Whilst mint stamps cannot be imported from Sweden, there is a fair amount of air-mail correspondence passing between our two countries, so readers should be able to obtain copies if they keep their eyes open.

The U.S.A. has added a 12th stamp to the set which is being issued in honour of the overrun countries of Europe. Denmark is the latest country to be added to the list, and this country will no doubt be glad to join the family. We in Britain will certainly be pleased to see that Denmark has been thus honoured, for ever since the days when Queen Alexandra came over as a consort for the late King Edward VII there has been a warm spot for the small country, which at the moment is giving Germany such a large headache. And who will forget that pre-war bacon and butter?

There must be many readers who collect stamps depicting ships as part of the design and just by way of a slight diversion we are illustrating a Canadian stamp which should be included in all such collections. Maybe not all our readers will know why. Solution next month.

Another set of Free French stamps, overprinted for use in Reunion, has appeared in London, and British collectors will be able to add another very interesting set to their collections, thanks entirely to the General de Gaulle organization, which brought the stamps over and as usual let them out at virtually face value. Unfortunately many collectors will not be able to afford a complete set, as they already sell for several pounds, so keen is the demand. Some collectors have gone for these Free French issues in a big way; one well known to us has spent several hundred pounds on them. No doubt some of the Methuselahs of the hobby will throw up their hands at the very idea of so much money being spent on stamps not issued during the years they were able to buy them at face.

It is not often that one of our colonies or protectorates issues a set of commemoratives, and when it does they are always worth picking up whilst they are current. Countless collectors have stories to tell how they overlooked buying a set of Falklands or Sierra Leone when they were available at just over £2, or how they let their spare set go for a fiver, the point being of course that they are beyond the reach of all but the richest of us. Well as the coming Tonga set will be offered for about two shillings, the moral is, don't put off buying this time, but please don't think it will ever be worth as many shillings as the big commemorative sets we have mentioned are worth pounds.

Another commemorative stamp due in November is a 2d. value printed in blue and brown. This is to be issued by Southern Rhodesia to commemorate the 50th anniversary of the occupation of Matabeleland. It will be nice to get one of these both mint and used, and it should be quite easy.

It is generally thought in Great Britain that the late King George V was about the first collector to go in for blocks of four, but according to an account given in American "*Stamps*," a Dr. G. F. Heath was collecting stamps thus as long ago as 1872. Can anyone beat the date? Since writing the above notes on the stamps of Grenada, it has been learned that the new printing of the 10/– value has appeared perforated also 11¾ as well as 14¼. So if we hadn't got a second front we have at least got a second perf. to plague us.

F.E.M.

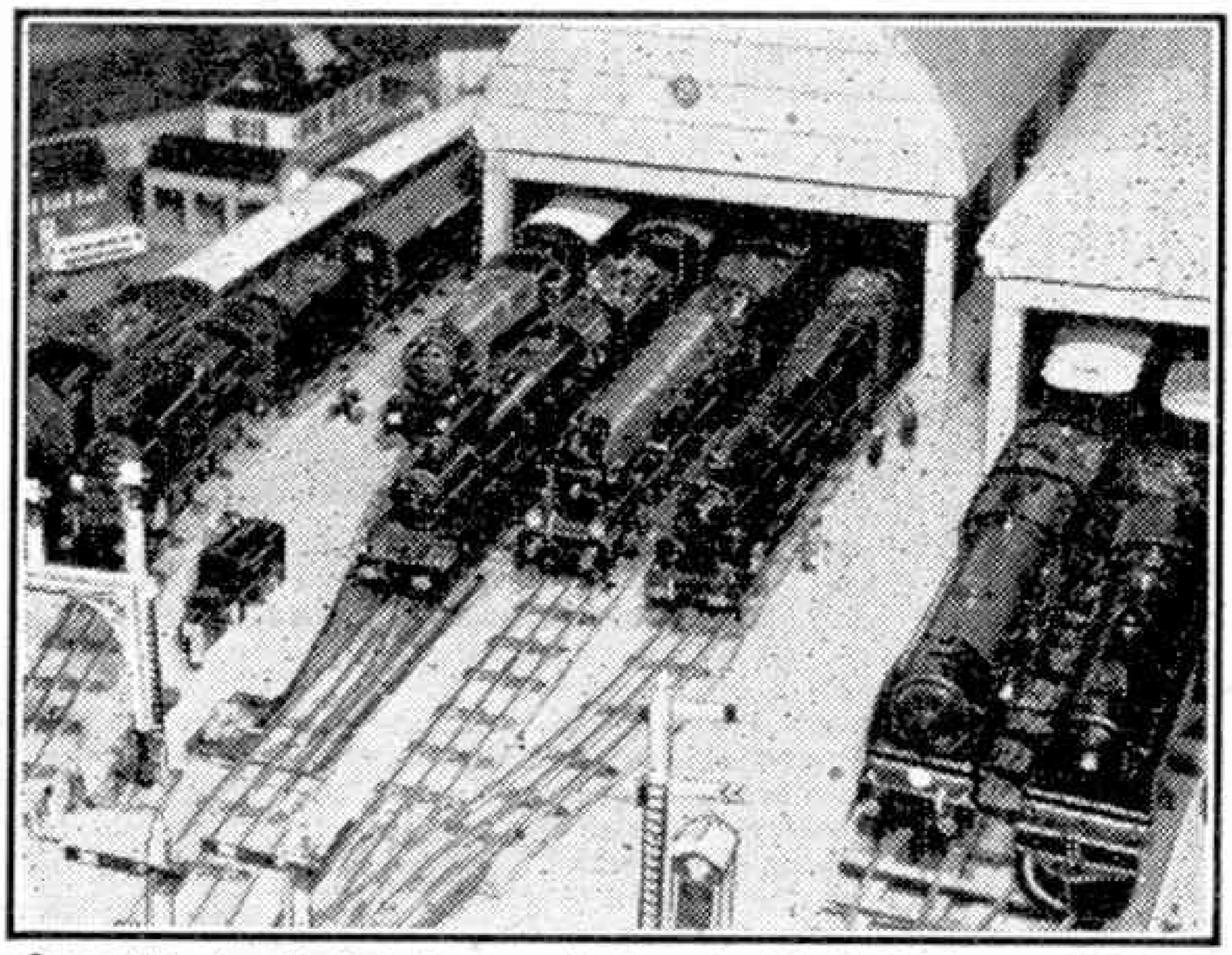
Stamp Collecting—(*Continued on page 355*)

If we want beautiful stamps we must not be afraid of beautiful designs, or designers who can produce them.

And the profit from special stamps? The U.S.A. sold over $50,000 worth of the "Polish" stamp the first day it was on sale, in two cities only, and most of those stamps will never do postal service.

A FINE CANADIAN LAYOUT

The illustration on this page shows an impressive scene on the miniature railway of a Canadian reader, J. A. Markham, Windsor, Ontario. Mr. Markham has an extensive double main line track, with a branch line and seven sidings, constructed of Hornby Solid Steel Track, and this is set in appropriate scenery, with mountains, miniature villages, fields and even a seaside section. There are two terminals, one with six tracks and the other with four, and several country stations. Mr. Markham is a great admirer of British railways. The trains he runs on his layout include miniatures of "*The Royal Scot*," "*The Cornish Riviera*" and other famous expresses, and in our photograph some of these, one of them headed by Hornby 4–6–2 "*Princess Elizabeth*," are shown ready to depart from the larger terminal station.



One of the terminal stations on the layout of J. A. Markham, Windsor, Ontario, Canada, with an impressive array of express trains.

All Among the Bombers—

(*Continued from page 328*)

his right side unprotected, as the armour is placed to protect the gunner in front on the assumption that he will be firing at his attacker, and the armour swings with the turret. The second Hun attacked from dead astern, an ordinary .303 bullet came in low down at the side of the turret, hit the gunner in the joint of the right thigh-bone and pelvis, went through his bladder and out of his left side.

He reported that he was hit, but refused morphia because, he said, they might be attacked again and he did not want to be dopey. So he held on all across Germany and France, and only when over the Channel did he let the others pull him out of the turret and dope him. Meantime, as the radio-navigator was dead, the pilot, a lad of 22, had to fly by compass heading merely for England.

When he was sure he was there, and with petrol for only 10 minutes left, he sent out his short-range S.O.S. signal, which was picked up and he was brought down safely on a strange aerodrome in six minutes. The tail gunner was rushed to hospital and the doctor operated on him at once. For 11 days he looked like recovering, and then suddenly he collapsed and went out. The whole station, at which he was a stranger, was much upset by his death, evidently because he had shown such pluck after he was hit and had put up such a good fight for his life in hospital. If he had been dead when he landed he would just have been a casualty—such is human nature.

(*To be continued*)

Some Humours of Cycling—(*Cont. from page 343*)

indulge in frequently was from London to Reading and back. During one return journey my lamp burnt itself out. However, I decided to ride on and get some oil as soon as I could. I had got just beyond Staines when a policeman suddenly appeared from the shade of the roadside, and running, took hold of my arm as I was passing him.

"Off you come," he demanded.

"Well, leave go of me," I replied, "and let me get off."

He released his hold, and I simply couldn't resist the temptation of springing away from him.

"It's all right" he called after me. "I'm in no particular hurry." From that I knew it was his intention to go to the nearest telephone and have my name and address taken somewhere ahead.

I hurried on for about half a mile, and then fortunately was able to get some oil at a cottage, and lit up again. A few miles farther on I found myself drawing near to four policemen, who were stopping and questioning all the cyclists.

When the first bobby had spoken to me my cap was in my jacket pocket and the jacket was on my handlebars. Moreover, in a knapsack, with dress clothes, I had an opera hat. On leaving the cottage I had taken the precaution to put on the jacket and the opera hat and to remove the clips from my trousers. Obviously the policemen had received no instructions to hold up any one in an opera hat, and they waved me on.

I rode to my journey's end in that opera hat!

Locomotive War Babies—(*Continued from page 337*)

which were due for extensive overhauling. But, instead of replacing wheels, cylinders, frames and other parts with new ones of the same kind or design, these 20 are a still greater improvement on the four previously rebuilt. In fact, they are being changed, in type, from the 2–8–2 "MacArthur" to the 4–8–2 "Mountain" type.

In addition to the four-wheel leading, or pony truck, other radical changes include a fire-box combustion chamber to provide additional heating surface, which necessitated lengthening the boiler shell; front bed section with cylinders, front part of frame, bumper deck and air pump brackets cast in one piece to eliminate cylinder, frame and brace bolts; Baker valve gear; oil lubrication on all driving journals; lateral cushioning device at rear drivers; stoker; power reverse gear; mechanical lubricator; two cross compound air compressors, superheater with rolled in units, etc.

An open type feed-water heater is located in the smoke-box, with cold water pump under the cab and hot water pump on the left side of the boiler near the front. The enlarged tender, with auxiliary water tank, carries 26 tons of coal and 27,500 gallons of water.

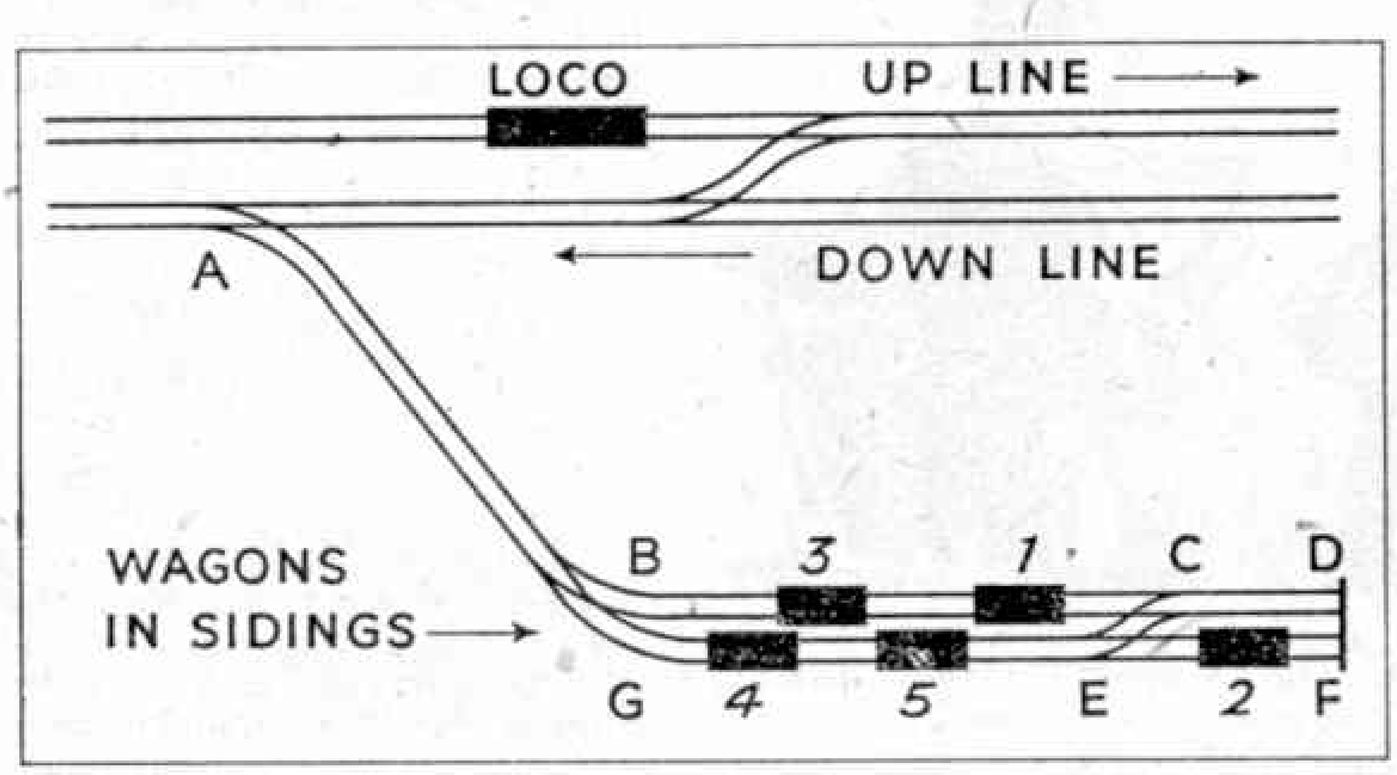
The rebuilt engines compare with the original as follows:

	Original	*Rebuilt*
Class	Q–1aa	T–3
Type	2–8–2	4–8–2
Cylinders	26×32	27×32
Steam Pressure	190	230
Diameter of driving wheels ...	64	70
Weight on drivers	223,600	255,000
Tractive Power	54,000	65,100
Cylinder horsepower	2,128	2,990
Pounds of coal consumed per 1,000 ton miles	78·4	65·7

Competitions! Open To All Readers

A Railway Shunting Puzzle

Our first competition this month is a shunting problem. It will be specially welcomed by all railway enthusiasts among our readers, but it is of such a nature that every reader can tackle it, for the necessary conditions are clearly explained and no railway knowledge is absolutely necessary.



The basis of the puzzle is the layout shown in the diagram on this page. This shows part of a main line, with up and down tracks, which of course may be regarded as extending indefinitely in both directions. There are two sidings, BD and GF, with a connecting portion AB, and standing on the sidings are five wagons in the positions shown. The puzzle is to show how the locomotive can marshal these in the correct order, with No. 1 immediately behind it, No. 2 behind that, and so on, and draw the entire train out of the sidings and along the down line.

Throughout the shunting operations neither locomotive nor wagons must enter the main line. The section AB is only long enough to hold the locomotive and one wagon; section CD will accommodate only one wagon or the locomotive, and EF is long enough for two wagons.

The Contest is divided into two sections, for Home and Overseas readers respectively, and in each prizes to the value of 21/–, 10/6 and 5/– will be awarded for the best solutions. If there is a tie for any prize, neatness and novelty will be taken into consideration by the judges. Entries must be addressed: "*Railway Shunting Puzzle, Meccano Magazine, Binns Road, Liverpool 13.*" The closing dates are: Home Section, 30th November; Overseas Section, 31st May, 1944. Do not forget to write your name and address on your entry.

What Meccano Parts are These?

A surprising number of words seem to be capable of two or more meanings, especially those for which an engineering or technical use has been found. Many of the names of Meccano Parts belong to this class, and we have noticed that with a little imagination some of these can be twisted into meaning something very different from that first thought of by model-builders. We are using this as the basis of a fascinating contest. Below we give 12 clues that lead directly and easily to the names of Meccano Parts that will be well known to every reader, and entrants in this contest are asked to find what parts are indicated.

Here are the 12 clues: **1. Stretch of water and behaviour. 2. Telegram and length without breadth. 3. Animal hold. 4. Bird snatch. 5. Australian vessel. 6. Queer folk. 7. Bits of clothing. 8. Moves backward and forward. 9. Seaside levellers. 10. Leaders on a string. 11. Insect turns. 12. Seasonal stoppers.**

When the parts represented have been found, all that is necessary is to make out a list of them on a postcard, giving in each case first the part number and then the name. The prizes will be awarded for the best lists received, and in the event of a tie for any of the prizes the judges will take into consideration the neatness and novelty of presentation.

There will be the usual two sections in this contest, for Home and Overseas readers respectively, and in each there will be three prizes, of 21/–, 10/6 and 5/– respectively, together with consolation prizes for efforts that miss one of the principal awards, but are deserving of recognition. Entries should be addressed "*October Meccano Parts Puzzle, Meccano Magazine, Binns Road, Liverpool 13,*" and those in the Home Section should be posted to arrive here not later than 30th November. The closing date in the Overseas Section is 31st May, 1944.

October Photo Contest

This month's contest is the 10th of our 1943 series, and in it, as usual, prizes are offered for the best photographs of any kind submitted. There are two conditions: 1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired, but entries in which the second condition stated above is not observed will be disqualified.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed "*July Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be separate sections for Overseas readers. In each section prizes of 15/– and 7/6 will be awarded. Closing dates: Home Section, 30th October; Overseas Section, 30th April, 1944.

Fireside Fun

A farm labourer was harrowing with one horse. "Gee up, Tommy! Come on, Jerry. Gee up, Bess. Steady, Prince," he shouted.

"Why do you call that horse so many different names?" enquired the curious onlooker.

"His real name is Tommy," replied the farm hand. "But he doesn't know his own strength, so I put blinders on him and yell out a lot of names, so that he thinks the other horses are helping him."

* * * *

"To what do you attribute your great age?"

"I don't know yet. There's several of them patent medicine companies bargaining with me."

* * * *

"What's Billy crying for?"

"He can't have a holiday."

"Why not?"

"He doesn't go to school yet."

* * * *

Johnny: "Have you ever seen pictures hanging up on a wall."

Tommy: "Of course. We have a lot."

Johnny: "You haven't. They all hang down."

* * * *

"What is your son doing now? The one who used to make Blackpool rock, I mean."

"Oh, he's in the R.A.F. making Hamburg rock."

* * * *

THIS MONTH'S HOWLER

Leap Year is instead of it being the next day, on the same day next year, it's the day after.

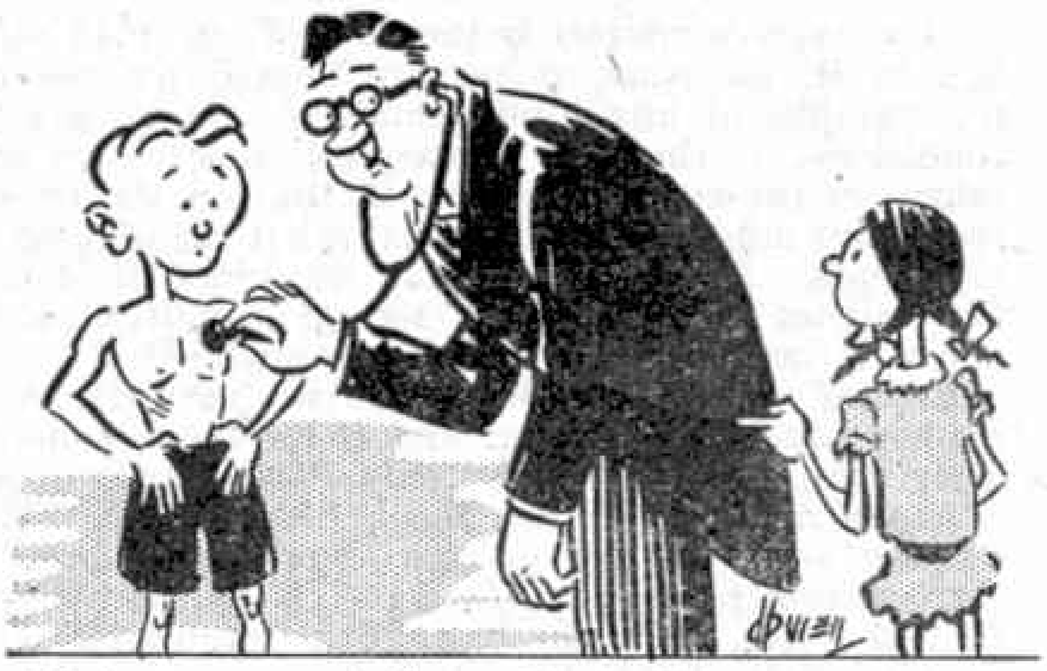
* * * *

BRAIN TEASERS

BIRDS AND BEASTS

The keeper of a Zoo couldn't remember how many animals he had under his charge, but for some reason known to himself he did know that there were 104 heads and 324 feet. Can you find from this how many of the creatures were birds and how many were animals?

* * * *



"Got any new stations, Doctor?"

A POCKET MONEY PUZZLE

Phillip and Henry were comparing pocket money. Phillip said that he would have half as much again if Henry were to give him half a crown, but he would be a loser by 1/6 if the two boys simply exchanged their pocket money. How much did each possess?

T.K.C.

* * * *

THIS LOOKS A HARD ONE

Here is what looks like a division sum. Each letter in it represents a figure, and the puzzle is to find the figures that make the division accurate.

```
EF)ABCD(IFG
   GA
   --
    HC
    FC
    --
    EDD
     CE
     --
      C.
```

This is not so difficult as it looks, and to help readers we point out that the letter D must be 0 for a reason that they should see for themselves. The rest can then be worked out step by step and the process should be found interesting.

* * * *

"Can I help you, Sir?"

"Yes! Just hold on to this strap while I get my fare out."

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

The first of our puzzles would no doubt be solved easily by eagle-eyed readers. The names were as follows:

FORD; AUSTIN; HURRICANE; FIAT; VAUXHALL; DEFIANT; FULMAR; HILLMAN; SKUA; RILEY; MORRIS; and STANDARD.

Two of these went slightly astray owing to misprints. They were DEFIANT and MORRIS, but we are sure that readers would spot the errors.

The second puzzle was an easy one also, but is the kind that occasionally mystifies. Clearly it would be impossible for the producer of the coin to know how many years were to elapse before Christ was born.

Our third puzzle was the easiest of all, for the couplet at the end pointed unmistakably to MECCANO. A check of the letters would verify this.

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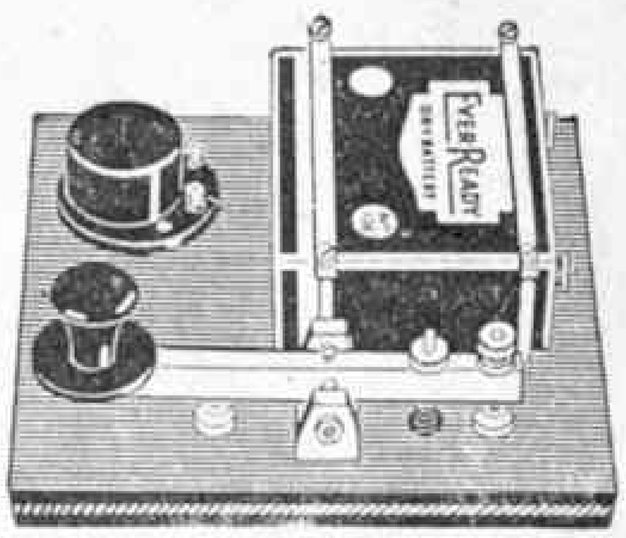

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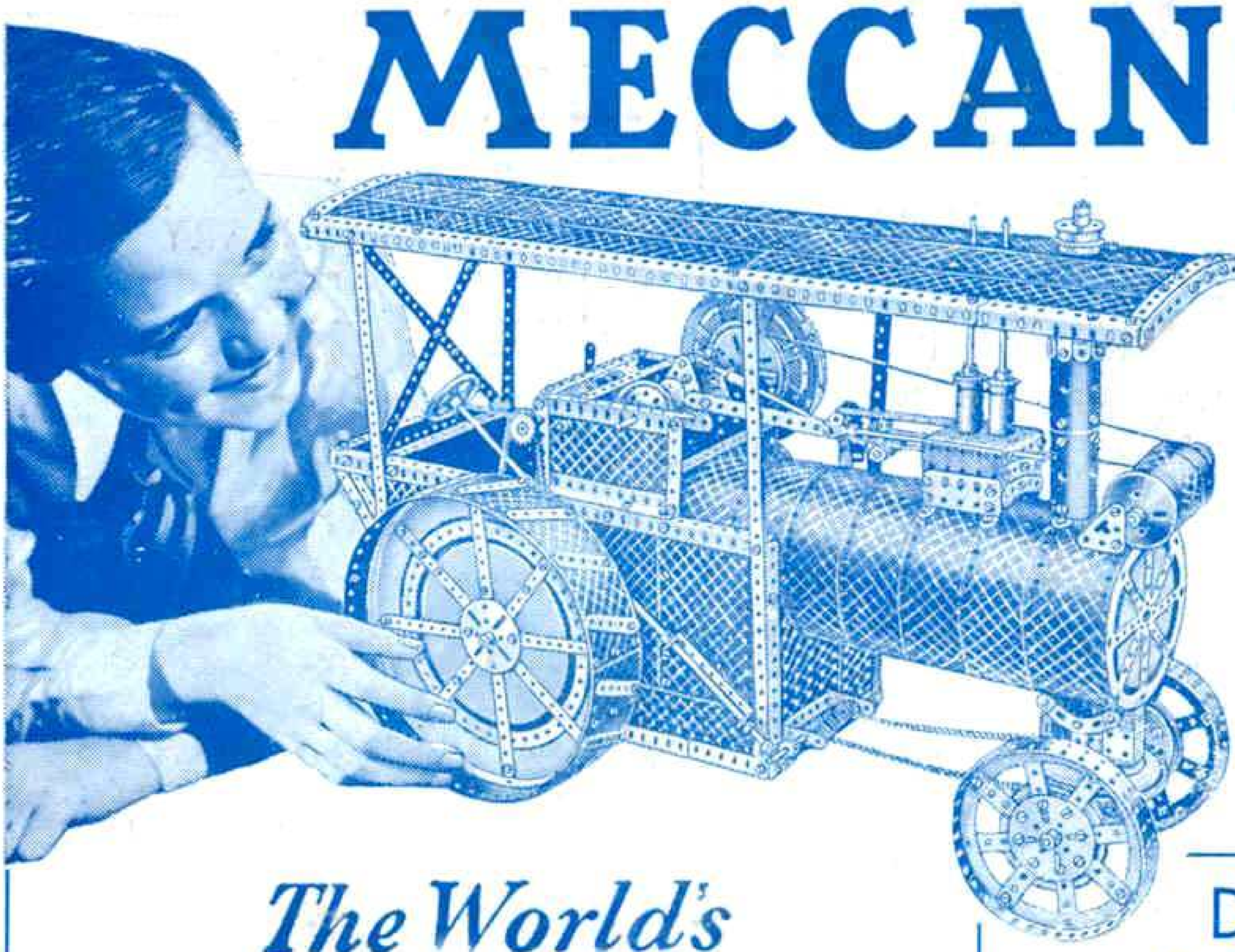

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